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(71) Applicant: MOORE BUSINESS FORMS, INC.
300 Lang Boulevard
Grand Island New York 14072-1697 (US)

(72) Inventor: Yaksich, Mary Jo
23 Bronson Road
Grand Island NY 14072 (US)
Inventor: Sprague, Darlene R.
871 Baseline Road
Grand Island NY 14072 (US)
Inventor: Bevilacqua, Samuel D.
153 Findlay
Tonawanda NY 14150 (US)
Inventor: Andersen, Andrew C.
242 Cottonwood Drive
Williamsville NY 14221 (US)
Inventor: Hoellig, Susan M.
15 Redoak Drive
Cheektowaga, NY 14227 (US)
Inventor: Carr, Donald S.
99 Zimmerman Boulevard
Kenmore, NY 14223 (US)
Inventor: Yarwood, Donna L.
78 Sundridge Drive
Amherst NY 14228 (US)
Inventor: Hoholik, Anthony P.
16713 Orchard Valley Drive
Gurnee, Illinois 60031 (US)

(74) Representative: Spence, Anne et al
Fry, Heath & Spence Mill House Wandle Road
Beddington Croydon Surrey CR0 4SD (GB)

(54) Form automation system.

(57) The invention provides a system for production of business forms, comprising:

first computer means comprising a forms automation platform means; for establishing each of a plurality of business forms in electronic format; for determining print format information for said forms; and for converting said electronic format to appropriate print formats based upon said distribution profile information and print format information, to design a business form in electronic format;

second computer means at each of a plurality of end user sites, including means for inputting variable information, if any, to be contained in the business forms to be produced;

third computer means comprising a central library means: for processing requests for distribution to effect electronic distribution of forms; and for providing information about print formats and distribution profiles to said second computer means, said means including a display and an inputting means for inputting commands regarding the specific business form or forms requested; and communication means for providing communication between said forms automation platform means and said central library means, and between said central library means and said end user sites. Also provided are methods of producing and distributing business forms using the system.

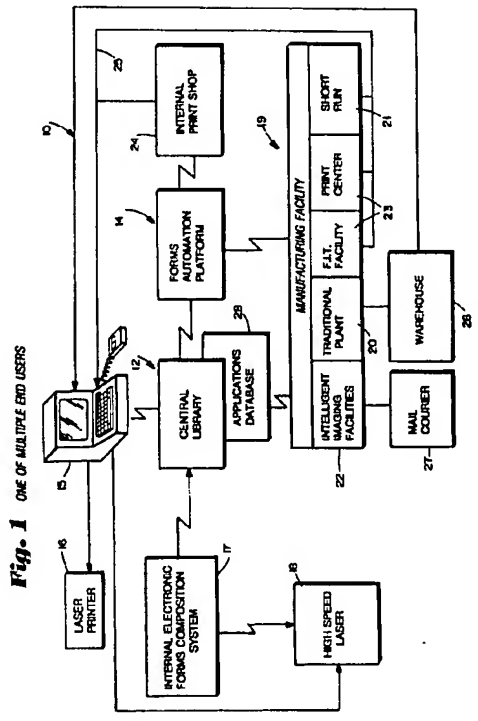

Fig. 1

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BACKGROUND AND SUMMARY OF THE INVENTION

Conventionally, large organizations that use large volumes of many different types of business forms have the forms printed in paper form internally or by a manufacturer of business forms, and then store the forms in one or more warehouses for distribution to each of the geographically remote user locations of that organization. Distribution costs can be significant, especially if the locations are widely disseminated, and there can be significant costs associated with the warehousing, inventory and obsolescence of preprinted paper forms. If attempts are made to do away with inventorying of preprinted forms, electronic forms may be stored for printing of paper forms on demand, however typically systems capable of electronic storage and retrieval are marketed by vendors supplying only one type of equipment, so that the systems are not versatile enough to be utilized even within a single location of the organization unless all printers and related equipment at that location are compatible. Further, such systems do not have conventional preprinted forms manufacture integrated therewith, and are therefore limited.

Also, when new forms are required, they are typically designed at a location where the need for the form is first recognized. The newly designed form may, or may not, become part of the forms package available to other interested parts of the organization, and even if it ultimately becomes available, may go through a redundant design sequence before being adopted by the organization headquarters. Usually, no centralized forms facility is provided, requiring redundant entry and processing of information in electronic or hard copy format.

According to the present invention, a system and method are provided which overcome the major elements of the problems identified above. According to the present invention, it is possible for a large consumer of forms, having numerous geographically remote user locations with varying needs for many different types of forms, to eliminate or minimize the warehousing, inventory, and obsolescence costs associated with preprinted forms, to minimize the number of preprinted forms utilized, to minimize redundant entry and processing of information, and to provide centralized design, control and management of electronic forms. According to the invention, the same form may be printed at a number of geographically remote locations on different types of printers, the forms can be distributed and updated automatically and efficiently, and if a form is needed but not readily reproducible on in house equipment, an order for the form may be transmitted to a vendor's manufacturing facility or facilities (eg. located geographically proximate the remote user locations to be served) for production and distribution.

The system according to the invention comprises as basic components first and second computer means, which comprise a central library facility (CLF), and a forms automation platform (FAP). Two way communication is provided between the CLF and FAP by appropriate communications software and protocol modules. The CLF is typically located at a centralized facility of the forms consumer (customer), while the FAP is typically located at a centralized facility of the vendor (forms manufacturer), although it may be located wherever convenient for performing the desired tasks to a particular customer's satisfaction A third computer means, typically a PC, is located at end user sites to communicate with the CLF and receive distributed forms therefrom.

The primary functions that take place at the FAP are: electronic forms design (at a centralized location), using one or more conventional design packages such as PERFORM, F3, JETFORM, or MECA III; creating, maintaining, updating, and ensuring the integrity of a display image library; logically associating print formats and distribution profile information received for each form within the display image library; converting display images to print formats based on the distribution profile specified for each form; downloading the print images to the CLF; executing electronic forms update processing; communication with the CLF; and communication with other print facilities (e.g. a manufacturer of business forms, and internal print shop, or the like) A release date is entered at the FAP, and managed at the CLF.

A FAP may service multiple CLFs and must then associate specific forms with specific CLFs. The FAP will generate print formats based on those printers supported by the customer to which the forms will be distributed.

The major functions of the CLF are file management and distribution, including the collection, assimilation and output of management information. The CLF also logically associates formats (print formats) and distribution profile information received for each form. The CLF electronically stores all of the forms previously supplied by the FAP, and effects transmission thereof to remote locations having use for them (the end user interface software), and the CLF, or the end user interface under control of the CLF, effects display or printing of forms -- regardless of exact terminal printer configuration -- at the remote user locations. The CLF collects and downloads the form images to the end users (ie the third computer means) on a release date, after polling of the computer (eg within the CLF) in which the images are located. This may be done completely automatically, or after manual verification.

In accordance with the present invention, there is provided a system for the production of business forms, comprising:

first computer means comprising a forms automation platform means: for establishing each of a plurality

of business forms in electronic format; for determining print format information for said forms; and for converting said electronic format to appropriate print formats based upon said distribution profile information and print format information, to design a business form in electronic format;

second computer means at each of a plurality of end user sites, for example including means for inputting variable information, if any, to be contained in the business forms to be produced;

third computer means comprising a central library means: for processing requests for distribution to effect electronic distribution of forms; and for providing information about print formats and distribution profiles to said second computer means, said means including a display and an inputting means for inputting commands regarding the specific business form or forms requested (and optionally means for inputting variable information, if any, to be contained in the business forms to be provided); and

communications means for providing communication between said forms automation platform means and said central library means, and between said central library means and said end user sites.

The printing means is preferably controlled by one or more of said computer means for printing out of paper business forms.

In one embodiment, the printing means comprises at least first and second printers having different printer formats, said printers located geographically remote from each other; and wherein said forms automation platform means creates the appropriate different printer formats for each form to be printed on said first and second printers; and wherein said central library means selects, and controls whichever of said printers is selected, utilizing the appropriate printer format, based upon the distribution information provided from said central library means.

The forms automation platform means can be located geographically remote from said central library means. Said central library means can control both said first and said second printers through said second computer means to produce the same paper form on each. The forms automation platform and the central library may be geographically remote from the end user sites.

In another embodiment of the invention, the system further comprises a source of preprinted paper business forms located geographically remote from said central library means, at least some of said forms being the same as the electronic forms in said central library means; and wherein said forms automation platform comprises means for managing said preprinted paper business forms to maintain inventory and to provide updating thereof, and means for effecting distribution of said preprinted business forms to said end user sites from said source.

In a further embodiment, the system may be arranged such that the forms automation platform means is located geographically remote from the central library means, and the system further comprises a business forms manufacturing facility geographically remote from said central library means; and wherein said platform automation means provides business forms in proper electronic format to said business forms manufacturing facility to effect manufacture thereof at said facility, so that the same paper form may be produced by said first printer, second printer, or manufacturing facility. In a further embodiment, the invention provides a system for the production of business forms comprising first, second and third computer means, and communications means, as defined hereinabove, wherein said third computer means comprises a file comprising customer profile information including an identification uniquely identifying each customer, and address information for the customer; a geographic profile including the customer identification and a unique code for each different geographic location of the customer's facilities; a printer profile file including the customer identification, and a code identifying each printer, and the type of printer, at each geographic location of the customer; a distribution data file including the customer identification, a code to uniquely identify each form for a customer, and the code to uniquely identify each printer; a form profile data file including the customer identification, and the code to identify each form for a customer; and a form output file including the customer identification, and a rode to uniquely identify the format of each form of the customer.

The first computer means of the above system may have a customer profile file including an identifier uniquely identifying a customer and a customer's address; a form profile file including the unique customer identifier, a unique identifier of a form for a customer, and physical information about the form; a form file name file including the unique customer identifier and unique identifier for the form, and the type of printer the form is designed for; and a distribution information form including the unique customer identifer, an indicator of whether or not a form has been selected for distribution to the third computer means, the unique form identifier, and the date of distribution of the form.

The form output file can also include a code that describes the form type, a code that describes a printer type, a file identification of where the format data is stored, and a code to tell if the form is compressed; and wherein the code to identify the format of each form identifies "print ready", "source", or " compiled".

In one embodiment, there is provided a system as defined hereinabove, wherein the form profile data file includes therein a code to uniquely identify each revision of each form, a description of the form, the software

package used to design the form, the date the form was created, the number of parts to the form, a code to identify landscape or protrait mode, the length of the form, and the width of the form.

The printer profile file can also include a description of the printer and printer type, a code of the printer type, and the name of the printer manufacturers. The form profile data file can be a parent of the form output format file and the distribution data file and can be a dependent of the customer profile file.

The system can further comprise a user profile file having the customer identification, an indicator which allows or prevents a user from signing on, and a flag to indicate new forms have arrived in the third computer means.

In a further embodiment, the system can comprise a site profile file interrelated with the geographic profile file, and including the customer identification, an identifier to uniquely identify each site for the customer, a description of each site, and a unique code for each different geographic profile used.

The system can further comprise a corporate profile file having the customer identification, a code for each different corporate profile within a customer, and a plurality of levels in the corporate organisation; said corporate profile file being a dependent of the customer profile file, and a parent of the site profile file. Alternatively, the system can further comprise a corporate profile file having the customer identification, a code for each different corporate profile within a customer, and a plurality of levels in the corporate organisation; said corporate profile file being a dependent of the customer profile file. In one preferred embodiment the system can further comprise a form field information file which is a dependent of the form profile data file, and includes the customer identification, the code to uniquely identify a form for a customer, a code to uniquely identify each revision of the form, a sequential number of fields within a form, a description of the length of the field, a description of the field format, and a description of whether the field is numeric, character, or the like.

In another aspect, the invention provides a system for production of business forms, comprising first computer means, second computer means, third computer means and communications means, as defined hereinabove; said first computer means having: a customer profile file including an identifier uniquely identifying a customer and a customer's address; a form profile file including the unique customer identifier, a unique identifier of a form for a customer, and physical information about the form; a form file name file including the unique customer identifier and unique identifier for the form, and the type of printer the form is designed for; and a distribution information file including the unique customer identifier, an indicator of whether or not a form has been selected for distribution to said third computer means, the unique form identifier, and the date of distribution of the form.

In such a system, the form profile file can include as the form physical information therein; the software on which the form was designed, the width of the form, the length of the form, the number of the pages in the form, the number of parts of the form, and the page orientation of the form. The said form profile file can also include the release status of the form, the system date on which the form was created and/or revised, and the system date on which the form was last released. The form profile file can be a dependent of said customer profile file, and a parent to a field description file having the customer identifier, the unique form identifier, the form field length, the form field data type, and the form field data format. In one particular embodiment, the distribution information file is not a parent or dependent of other files.

The present invention also provides a system for automating business forms creation, management and production, comprising:

printing means;

first computer means, including a business forms automation platform means, comprising: means for designing customer business forms; means for managing display images for existing business forms in electronic format; and means for converting display images into appropriate print formats;

second computer means including a central library means comprising an electronic data base of print images for a plurality of different business forms, and of distribution location information for each of said forms; and means for managing said print images;

means associated with said computer means for controlling said printing means so that said printing means will print business forms in response to print images from said second computer means; and

means for providing two way communication between said first and second computer means.

The system may further comprise third computer means at end user locations remote from said first and second computer means, and means for providing two way communication between said second and third computer means for transmission of data -- including electronic business forms -- and instructions.

In a further aspect, the invention provides a method of electronically developing, producing, managing and distributing a plurality of different business forms for an entity having a plurality of geographically remote use locations with different needs for different business forms, comprising the steps of:

(a) at a centralized location, storing the plurality of business forms in electronic format including print images;

(b) based on geographic location, volume requirements, form construction, and equipment profile, determining which of the geographically remote use locations will be provided with business forms, and storing that information at said centralized location; and

(c) through electronic scheduling or in response to commands input at said centralized location, automatically distributing forms from the centralized location to the geographically remote use locations for that particular form, according to the determinations provided in step (b).

The method can comprise the further step (d) of providing for electronic storage of the forms at decentralized locations and subsequent processing. The subsequent processing can comprise selecting either data entry and production using electronic imaging or traditional production, as determined in step (b). Step (a) is practised to store the business forms to be distributed to both the first and second use locations in both the first and second printer formats; and sep (c) is practised to automatically distribute forms in electronic format to the first and second printers, for printing into paper forms at the first and second use locations. This insures that the most current version of the form is available at all sites, including data entry and/or production sites.

According to one embodiment of the method, the centralized location can comprise a first centralized location, and a second centralized location; and can comprise the further step (d) of designing and modifying the business forms in electronic format at the second centralized location. The second centralized location can be geographically remote from the first centralized location, and from the use locations. The method can comprise the further step of, at the second centralized location, storing information about up-dating and release date information for the forms in electronic format, and automatically transmitting the up-dated forms in electronic format and release information to end user sites at the appropriate time.

In another embodiment of the method, a first of the use locations has a first printer with a first printer format, and a second of the use locations has a second printer utilizing a second printer format different from the first printer format; step (a) being practised to store the business forms to be distributed to both the first and second use locations in both first and second printer format; and step (c) being practised to automatically distribute forms in electronic format to the first and second printers, for printing into paper forms at the first and second use locations. The said centralized location may be at one of the use locations.

The said method can comprise the further step (e) of, in response to commands entered at centralized or remote locations, distributing electronic forms through a communication network for (i) subsequent processing by end users, or (ii) subsequent production by end users.

The invention also provides a method of handling business forms, comprising the steps of:

(a) creating a plurality of business forms in electronic format using a plurality of different business form creating computer programs;

(b) maintaining the business forms created in step (a) in a display image format to which variables may be added for variable image data;

(c) converting the display of form image format for each of a plurality of forms to desired printer formats;

(d) simultaneously transmitting the printer formats to each of a plurality of compatible printers; and

(e) printing out the forms on the compatible printers.

Step (c) above can be practised utilizing the business form creating computer programs themselves.

The invention further provides a method of providing a user of a plurality of different business forms at a plurality of geographically remote locations with the business forms in an efficient manner, and without the necessity of warehousing preprinted paper forms, comprising the steps of:

(a) storing the business forms in electronic format at a centralized location;

(b) producing the business forms in paper form at geographic locations proximate each of the geographically remote use locations in response to an electronic order generated by a centralized or remote command; and

(c) delivering the business forms in paper form to each of the geographically remote use locations after production thereof.

Steps (b) and (c) can be practised simultaneously at at least one of the geographically remote use locations. With such an arrangement, the centralized location can be a first centralized location, and the method can comprise the further step, (d) of creating business forms in the electronic format at a second centralized location, and transmitting the created form in electronic format to the first centralized location. The first and second centralized locations can be geographically remote from each other. In the aforesaid method, a first printer can be provided at one of the use locations and a second printer can be provided at a second use location, the printers having different printer formats, steps (d) and (a) being practised to create and store business form in both printer formats; and steps (b) and (c) being practised to produce the same business form with each of the first and second printers.

With reference to the method of providing a user of a plurality of different business forms at a plurality of geographically remote locations defined hereinabove, the centralized location can be a first centralized location

and the method can comprise a further step, (d), of creating business forms in an electronic format at a second centralized location, and transmitting the created form in electronic format to the first centralized location. In such a method, a first printer can be provided at one of the use locations and a second printer can be provided at a second use location, the printers having different printer formats, steps (d) and (a) being practised to create and store business form in both printer formats; and steps (b) and (c) being practised to produce the same paper business form with each of the first and second printers.

In a further embodiment of the method described hereinabove, steps (b) and (c) can be practised by producing the business forms in a business forms manufacturing facility geographically proximate, but still distinct from, a use location, and delivering the paper forms via motor vehicle from the manufacturing facility to the use location.

In a still further aspect, the invention provides a method of distributing business forms to each of a plurality of remote (eg geographically remote) end users, comprising the steps of;

(a) storing in electronic format in a computer a plurality of different business forms;

(b) also storing in the computer predefined commands, including date and extent of distribution commands, relating to the distribution of the electronic business forms;

(c) periodically polling (for example, once every weekday) the computer to locate applicable date commands; and

(d) in response to applicable date commands located in step (c), automatically distributing the electronic business forms to those of the plurality of end users specified by the distribution commands.

In another aspect, the invention provides a method of distributing electronic images to each of a plurality of geographically remote end users, comprising the steps of:

(a) storing a plurality of different electronic images;

(b) also storing in the computer predefined commands, including date and extent of distribution commands, relating to the distribution of the electronic images;

(c) periodically polling (for example, once every weekday) the computer to locate applicable date commands; and

(d) in response to applicable date commands located in step (c), automatically distributing the electronic images to those of the plurality of end users specified by the distribution commands.

A method of distributing business forms to each of a plurality of geographically remote end user is also provided which comprises steps (a), (b) and (c) of the method of distributing business forms defined hereinabove, and comprises the further steps (d) whereby in response to applicable date commands located in step (c), the electronic business forms are readied for distribution to those of the plurality of end users specified by the distribution commands; and (e) the distribution of the electronic business forms to those of the plurality of end users specified by the distribution commands is manually verified, and, after manual verification, the electronic business forms are automatically distributed to those of the plurality of end users specified by the distribution command. Steps (d) and (e) can be practised at a location remote from the geographically remote end users. In the said method, a second computer can be located at each of the geographically remote end users, and step (e) can be facilitated by two way communication between the computer and the second computer.

Even more generally, the invention contemplates practising the above steps for any electronic images, not just business forms.

A method of distributing electronic images to each of a plurality of geographically remote end users, is also provided, which comprises steps (a), (b) and (c) of the method of distributing electronic images defined hereinabove, but which comprises the further step (d) in response to applicable date commands located in step (c), readying the electronic images for distribution to those of the plurality of end users specified by the distribution commands; and (e) manually verifying the distribution of the electronic images to those of the plurality of end users specified by the distribution commands, and after manual verification, automatically distributing the electronic images to those of the plurality of end users specified by the distribution commands. Steps (d) and (e) can be practised at a location remote from each geographically remote end users. A second computer may be located at each of the geographically remote end users, and step (e) may be facilitated by two way communication between the computer and the second computer.

In a further aspect the invention provides a system for the production of business forms comprising:

a first location having a first printer with a first printer format;

a second location with a second printer having a second printer format, said second location being geographically remote from said first location;

a first computer means for storing electronic business forms in both the first and second printer formats, said first computer means being located geographically remote from said first and second printers; and

communication means for interconnecting said first computer means and said first and second printers

so that said first computer means transmits commands to said first and second printers to print the same paper form on both.

The system can further comprise a second computer means comprising means for creating electronic business forms, and second communication means for transmitting created electronic business forms from said second computer means to said first computer means.

Furthermore, the system can further comprise a third computer means located at each of said first and second printers, and comprising means for receipt of commands from said first computer means and controlling said printers in response thereto.

The invention also provides a method of handling business forms, comprising the steps of:

(a) creating a plurality of business forms in electronic format;

(b) maintaining the business forms created in step (a) in a display image format to which variables may be added for variable image data;

(c) electronically transmitting the display image formats; and

(d) ultimately converting the display of form image formats to desired printer formats.

The method of handling business forms can comprise the further steps of:

(e) simultaneously transmitting the printer formats to each of a plurality of compatible printers; and

(f) printing out the forms on the compatible printers.

In a further aspect, the invention provides a method of electronically developing, producing, managing and distributing a plurality of different business forms for an entity having a plurality of geographically remote use locations with needs (eg different needs) for different business forms, comprising the steps of:

(a) at a centralized location, storing the plurality of business forms in electronic format including by providing each with the following data associated therewith: identification code for the form; verbal description of the form; software package used to design the form; date of form creation and/or last revision; number of parts to the form; whether the form has landscape or portrait mode; length of the form; and width of the form;

(b) based upon geographic location, volume requirements, form construction, and equipment profile, determining which of the geographically remote use locations will be provided with business forms in electronic and/or preprinted form, and storing that information at said centralized location; and

(c) through electronic scheduling or in response to commands inputted at said centralized location, automatically distributing forms in electronic and/or preprinted form from the centralized location to the geographically remote use locations for that particular form, according to the determinations provided in step (b).

In a particular embodiment of the aforesaid method, there is provided a method wherein a first of the use locations has a first printer with a first printer format, and wherein a second of the use locations has a second printer utilizing a second printer format different than the first printer format; and wherein step (a) is practised to store the business forms to be distributed to both the first and second use locations in both the first and second printer formats; and wherein step (c) is practised to distribute formats in electronic format to the first and second printers, for printing into paper forms at the first and second use locations.

In a particular embodiment, a plurality of printers are provided at the use locations, and the method comprises the further step of assigning a unique printer code to each of the printers, steps (b) and (c) being practised by transmitting the appropriate printer format electronic form to each of the selected printers utilizing the unique printer code.

In still another aspect, the invention provides a method of electronically creating and managing a plurality of different business forms, utilizing a first computer at a first location, and a second computer at a second location, comprising the steps of:

(a) at the first computer, creating a plurality of business form in electronic format, including printer formats;

(b) allocating a session with the second computer;

(c) designating appropriate business forms for transfer;

(d) electronically transferring the designated forms from the first computer to the second computer;

(e) confirming that the transfer has taken place; and

(f) initiating a table population function at the second computer, and confirming when that function has been completed.

In a yet further aspect the invention comprises a method comprising the steps of:

(a) storing in electronic format in a computer a plurality of different business forms;

(b) also storing in the computer predefined commands, including date and extent of distribution commands, relating to the distribution of the electronic business forms;

(c) periodically polling the computer to locate applicable data commands;

(d) identifying forms for distribution in the computer;

(e) establishing a session between the computer and an end user;

(f) transferring the forms electronically from the computer to the end user; and

(g) acknowledging receipt of the forms by the end user from the computer.

It is primary object of the present invention to provide for the effective and efficient creation and production of electronic and preprinted business forms for large consumers of forms having multiple locations. This and other objects of the invention will become clear from an inspection of the detailed description of the invention, and from the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a schematic block diagram comprising a high level functional overview of an exemplary system which is implemented according to the invention;

FIGURE 2 is a block diagram showing one embodiment of a more detailed interrelationship between the components of the FIGURE 1 system;

FIGURE 3 is a block diagram showing an overview of the interconnections between the central library facility (CLF), forms automation platform (FAP), and end users;

FIGURE 4 is a schematic view of the FAP;

FIGURE 5 is a schematic like that of FIGURE 4 for a host computer utilizable with the CLF and the FAP;

FIGURE 6 is a data model diagram for data structures provided by the FAP, for detailed implementation according to the invention;

FIGURE 7 is a data flow diagram of exemplary program control processes performed by the FAP, for detailed implementation according to the invention;

FIGURES 8a-8e are schematics giving lower level breakdowns of the major elements of FIGURE 7;

FIGURE 9 is a flow diagram illustrating access to the CLF from the FAP;

FIGURE 10 is a schematic diagram illustrating exemplary components of the CLF of the system of FIGURES 1 and 2;

FIGURE 11 is a CLF data model diagram, for detailed implementation according to the invention;

FIGURE 12 is a schematic showing the CLF data base relationships, for detailed implementation according to the invention;

FIGURES 13a-13i provide a schematic structure chart for the CLF, for detailed implementation according to the invention;

FIGURE 14 is an exemplary flow diagram for releasing forms from the CLF to end user sites based upon a distribution profile;

FIGURE 15 is an exemplary flow diagram for transmitting an electronic form, initiated at the CLF; and

FIGURE 16 is an exemplary flow diagram for transmitting a print request, initiated at the CLF.

DETAILED DESCRIPTION OF THE DRAWINGS

The forms automation system according to the present invention is illustrated generally by reference numeral 10 in FIGURES 1 and 2. The forms automation system 10 will be utilized by those consumers of business forms who have large numbers of business forms (both type and amount) that will be utilized at a number of geographically remote use locations. The system 10 is designed to be marketed by a business forms manufacturing company that has conventional forms production facilities, although it could be marketed by a wide variety of different types of companies. The system 10 is particularly useful when it it implemented in such a way that forms may be produced directly at the use locations, or in a conventional manufacturing facility, depending upon the construction of that particular form, the extent of its distribution, the quantity of forms utilized, and the like.

In this description, the term "vendor" or "manufacturer" when utilized refers to the entity providing the forms automation system according to the invention, typically a conventional business forms manufacturer. The term "customer" or "user" refers to the vendor's customer, namely the organization that has a plurality of geographically remote use locations, and consumes the business forms (also encompassing multiple departments that are remote within the same building, for example).

The major objectives of the system 10 are to provide for the centralized design of business forms, the centralized management and distribution of electronic and pre-printed (paper) forms, the co-existence of the same form in both paper and electronic formats, and the flexibility to meet the user's requirements. The major components of the system 10 comprise computer means providing the central library facility (hereinafter denoted by the acronym "CLF") 12, and computer means providing the forms automation platform (hereinafter denoted by the acronym "FAP") 14. The CLF 12 is preferably located in one of the customer's facilities (e.g. the same facility that has the main frame computer 34). This also typically is one of the use locations. The FAP 14 may, under some circumstances, be located at a customer's facility, but more typically is located at one of the ven-

dor's facilities. In any case, the CLF 12 and FAP 14 provide for centralized design, management, and distribution of business forms. Appropriate conventional communications components are provided to inter-relate the CLF 12 and FAP 14, and to communicate with a variety of other stations.

In the schematic illustration in FIGURE 1, the end user station 15 comprises a plurality of geographically remote use locations, each of which may have a printer -- such as a laser printer 16 -- associated therewith. A computer, such as a PC, is provided at each of the use stations 15, as schematically illustrated in FIGURES 1 and 2, interfaced (two way communication) with the CLF 12. The PC and CLF may utilize IBM's OS/2 (version 1.2), or an equivalent multi-tasking operating system.

The CLF 12 may also control an internal electronic forms composition system 17 maintained by the organization having the geographically remote use locations 15, which may in turn control a high speed printing device, such as a high speed laser printer 18, or other non-impact printer. Both the CLF 12 and FAP 14 may also provide information to a standard business forms manufacturing facility, shown generally by reference numeral 19, for producing business forms. For example, the CLF 12 could access facility 19 through an external applications data base 28. Different types of manufacturing facilities encompassed by facility 19 may -- for a large conventional business forms manufacturer such as Moore Business Forms, Inc. -- include a traditional plant 20, a short run facility 21, an intelligent imaging facility 22, or other types of facilities 23. Also, the FAP 14 may control an internal print shop 24 at the FAP 14 location, for providing camera ready copy. The printing facilities 21, 23, and 24 deliver printed forms -- as indicated by line 25 -- to the use locations 15 via a motor vehicle or the like (e.g. a common carrier), while the traditional plant 20 supplies paper forms to the use locations 15 through a warehouse 26 run by the forms manufacturer, a contractor, or another. The imaging facilities 22 typically provide paper forms to the use locations 15 via mail or a courier service 27 or the like.

As illustrated schematically in FIGURE 2, the CLF 12 includes an internal applications data base 29 (and associated database access mechanisms), and includes as part of the preferred embodiment communication facilitating components thereof, such as a vendor supplied token ring (or other network adapter) 30 communicating with an (e.g. token ring) electronic data network 31. The applications data base 29 may have as its data model "SQL", a commercially available package, such as that sold by IBM with its OS/2 (version 1.2) system A conventional communications interface component 32, such as an IBM 3270 standard protocol interface, is also preferably provided, as is the communications protocol module 33. The CLF 12 may be provided on main frame computer 34 directly at a customer (user's) location, with a front end processor 35 -- such as an IBM 3745/3720 -- interconnected between the module 33 and the computer 34, and a front end processor 36 -- e.g. an IBM 3745/3720 -- connected between the main frame computer 34 and the token ring network 31.

The forms automation platform 14 includes a commercially available applications database 37 (such as that sold by Oracle Systems Corp under the trademark "Oracle"), with a component thereof 38 providing custom design of the forms. The forms design function is preferably accomplished utilizing a compatible commercially available primary design software package, such as Perform, sold by Delrina Technology, JETFORM, sold by Indigo, or MECCA III ("DOCS"), sold by Amgraph. A communications protocol module 39 is also utilized (such as an IBM SDLC), while the token ring adapter 40 is provided for optional communications over token ring network 31.

One of the primary functions of the FAP 14 is to provide for the centralized design of business forms. It is the entry point into the system 10, and contains software that controls the execution of the other processes within the system 10. As earlier indicated, forms design packages are associated therewith, such as the DOCS, or PERFORM, packages. The forms may be designed elsewhere and downloaded to the FAP 14 prior to transmission to the CLF 12. The FAP 14 communicates with the CLF (preferably two way) by modems 41, or a token ring, or networked protocols defined by the IEEE 802.5 or 802.2 standards. A terminal 43 (see FIGURE 4), including a display screen 44, and inputting means such as a keyboard 45 and/or mouse 46, are provided as a human interface to the FAP 14. Other technologies could also be utilized, such as scanners and digitalization apparatus.

In addition to the forms design packages, the FAP 14 contains application software for a number of other functions. A file management function manages display (source) images for all released forms and forms that are scheduled for up-date/release. This software creates, maintains, up-dates and ensures the integrity of the display image library.

A user friendly interface function is provided by software that allows the operator to be queried for information regarding print formats and distribution profiles for each form. This information is logically associated with the display image within the file management system function so that whenever an electronic form is created or up-dated, it will have the necessary components. The forms administrator at the FAP 14 will obtain the following information for each electronic form created or up-dated: form identification; form description; form processing (e.g. new/update); the design software used to design the form; the release date; the security level; the distribution profile (user sites, output devices/sites, generic customer environment information); the paper

base production requirements (e.g. manufacturing facilities, or internal print shops for camera ready copy); and variable data field encoding.

The FAP 14 also converts the display images to appropriate print formats based upon the distribution profile specified for each form. This is typically done right in the forms design package 38 itself (e.g. in PERFORM). The operator inputs what printer formats the form is to be provided in, and the package 38 does the necessary formatting (either single or multiple). That is, if a form is to be distributed at a first location having a first printer with a first printer format, and to a second geographically remote user location, having a second printer with a second printer format (e.g. a different manufacturer for the second printer than the first printer), the display images must be converted to print formats for both the first and second printers. That is, the same electronic business form will exist in different formats. The print image files will be validated for existence, having been previously formatted based upon the customer profile, and downloaded to the CLF 12. The CLF 12 may effect distribution on a scheduled release date. Of course this is practiced with any number of printers.

The system 10 may have any one of the following output formats: display image; encoded display image; print format; and production output. The display image format may require no conversion, and -- for example -- can be used to merely display the form on a screen (e.g. the screen 44 of the CLF 12). For the encoded display image format, the operator at the FAP 14 has encoded the variable data fields, and this format is used for merging variable data with the electronic form in a conventional manner via a batch process at the user site. This format, too, can be sent to a display terminal (e.g. 44). Print formats should be able to support output to postscript printers, as well as for printers for all other major manufacturers such as IBM, Hewlett Packard, Xerox, etc. The production output formats will support an output for a manufacturing production facility 19, via a PC to PC (eg DOCS to DOCS) transmission. This output may be used to produce camera ready copy. This will insure the most updated form at all times. It also will provide an output to control an internal print shop 24 for producing camera ready copy.

As earlier indicated, the FAP 14 communicates with the CLF 12 via modems 41, token ring 31, or the like. Print images and form profiles are transferred to the CLF 12, and update processing within the CLF 12 is scheduled. Display and print images for updated forms will be downloaded to the CLF 12, and appropriate file management functions, such as archiving, will be scheduled and performed.

Major components of the data flow diagram of FIGURE 7 include the FAP administrator software 86, form maintenance process 87, profile maintenance process 88, CLF administrative software 89, CLF update process 90, a report generation process 91, and the FAP utility process 92. FIGURE 8a illustrates a detail data flow diagram for the form maintenance process 87. FIGURE 8b illustrates a detail data flow diagram for the profile maintenance process 88 FIGURE 8c illustrates detail data flow diagram for the CLF update process 90. FIGURE 8d illustrates a detail data flow diagram for the report generation process 91; and FIGURE 8e illustrates a detail data flow diagram for the FAP utility process 92.

FIGURE 5 provides a schematic of a conventional host computer 34 and its interrelationship to other components in a typical configuration. The computer 34 may include applications software 49, a printer control 50, and a communications module 51. A printer 52, such as an IBM 3800, is controlled by the printer controller 50 software, e.g. JES AND AFP, both by IBM. Other printers 52, such as the Xerox 9700, of course may also be utilized. The communications module 51, such as an IBM SNA, is interconnected with a communications controller 53, such an an IBM 37XX FEP. A personal computer 54 may be interconnected to the controller 53 via a token ring or other link, and control a locally attached printer 16, or access other printers in the network. The controller 53 is connected through modems 55 to other PCs 54 (at sites 15). Controller 53 can communicate through the token ring 31 with the CLF 12 and FAP 14, or through modems 42 with the CLF 12. Communications may also be provided optionally through modems 56 with a cluster controller 57 -- such as an IBM 3174/3274 -- which in turn is interconnected with a communications interface (such as an IBM 3270) and a PC (such as a 3270 emulation PC). PC 58 may function as a print/file server to support multiple devices.

The controller 53 (typically located on host 34) will run a version of a network control program (e.g. OS/2 version 12 from IBM) that supports peer to peer networking. The PC 54 has a Moore Forms Print Server. Therefore, CLF 12 communicates directly with PC 54 through controller 53 automatically, without "bothering" host 34.

The major menu items provided to the user of the FAP 14 are provided on menu screens. The main menu will allow selection of the forms design program, updating the central library with selected forms, defining a form profile for a current form, defining form fields for a current form, customer profile information, CLF profile information, and a customer profile query. Many others may also be provided. Typical screens for each of these above specific menu items are as follows:

For forms design, a list of the design software defined for a particular customer will be displayed, e.g.:

```
Form      Profile      Library      Reports      Utility      Exit
Run Form Design Program

Enter Customer ID:  3-1234567-00000
      Form SW
      JFDESIGN
      PERFORM
      F3

Char Mode:  Replace   Page 3                Count:   3
```

For downloading information (e.g. forms and release dates) to the CLF 12:

```
  Update     Exit
Update Central Library with Selected Forms.
CLF ID:   SAVANNAH      CENTRAL LIBRARY UPDATE
Select    Customer ID              Form ID      Rev      Status          Dist Date
          3-1234567-00000          TINFORM      0        Completed
          3-1234567-00000          SIGDEMO      0        Completed
          3-1234567-00000          UMIVFILL     0        Completed

Press [F5] to return to menu
To select Form for Library Update, enter '*'.  To save selections, press [F10].
       Char Mode:  Replace    Page 1              Count:  3
```

For encoding a variable data information field, which is sent to the CLF 12 and verified there:

```
  Profile    Query    Ext
Define Form Profile for current form.

                                                    FORM FIELDS
Field Name          TIMFLD1          Sequence 1     Location 2x4in
Field Type          CHAR     Length 8          Format*******X
Validation          NONE
Calculation         NONE
Field Name          TIMFLD2          Sequence 2     Location 2x3in
Field Type          CHAR     Length 10         Format********X
Validation          NONE
Calculation         NONE
Field Name          TIMFLD3          Sequence 3     Location 4x4in
Field Type          DATE     Length 8          FormatMM-DD-YY
Validation          NONE
Calculation         NONE

Press [F5] to return to menu

Char Mode:     Replace     Page 2              Count:  3
```

For illustrating form profile information for a form which has been created:

```
   Fields      Query      Exit
Define Form Fields for current form.
                                        FORM PROFILE INFORMATION
Cust ID   3-1234567-00000      Cust Name  XYZ BANK
Form ID   TINFORM       Descr   CUSTOMER ADD & TIN CHANGES-HP W/S2 CART.
Revision  0    Form Status   NEW       Release Status COMPLETED
Form Path  C:\XYZBANK

Form Width     8.5       No. of Pages 1       FORM FILES:
Form Length    11        No. of Parts 1       File Name       PD   Type    CLF ID
Orientation    PORTRAIT        Duplex N       TINFORM.IFD     HP   S       SAVANNAH
Form SW        JFDESIGN                       TINFORM.MDF     HP   C       SAVANNAH
                                              TINFORM.PRT     HP   P       SAVANNAH

               By                Date
Created        FAP               19-NOV-90
Modified       FAP               19-NOV-90
Released

Press [F5] to return to menu

Char Mode:   Replace    Page 1                  Count:  1
```

An exemplary screen for inputting data, e.g. customer profiles, is:

```
   Query       Exit
Move to query screen

                                        CUSTOMER PROFILE INFORMATION
   Cust ID  3-1234567-00000   Directory C:\CSBANK
 Cust Name  XYZ BANK                      Phone Number  (800) 800-8000
   Contact  S. Jones                        Fax Number  (800) 800-8001
     CUSTOMER ADDRESS:                     SHIPPING ADDRESS:
Addr   222 MAIN STREET                 Addr 222 MAIN STREET

City   SPRINGFIELD                          City SPRINGFIELD
State  ME  Zip  00001  Cntry  USA      State  ME  Zip  00001  Cntry  USA
                                          Attn  S. JONES

HW/SW          HW/SW Name:          Description
S              JFDESIGN             JETFORM DESIGN V. 2.1
H              HPLJIID              HEWLETT-PACKARD LASERJET IID
S              PERFORM              PERFORM V.2.1

Press [F5] to return to menu

Char Mode:  Replace   Page 1                    Count 1
```

An exemplary screen for inputting CLF profile information is:

```
Query       Exit
Move to query screen

                              CENTRAL LIBRARY FACILITY PROFILE INFORMATION
                                                                  Customer ID
CLF ID              SPRINGFIELD                                   3-1234567-00000
Location            XYZ BANK, SPRINGFIELD, ME
Description         IBM PS/2 MODEL 80, )S/2 V. 1.2
Administrator       S. JONES
Phone Number        (800) 800-8000
Modem Number        (800) 800-8002
Fax Number          (800) 800-8001

Press [F5] to move to menu

Char Mode:   Replace   Page 1                Count 1

Exit
Return to master record
```

An exemplary customer profile query screen is:

```
                                CUSTOMER PROFILE QUERY
                                      Cust ID
                                   3-1234567-00000
                                                        Hardware/Software

CLF ID                                                  Type        Name
SAVANNAH                                                H           HPLJIID
                                                        S           JFDESIGN
                                                        S           PERFORM
```

The data model diagram for FAP 14 is provided in FIGURE 6. The same conventions are utilized here and as in the CLF data model diagram of FIGURE 11. The connections in FIGURE 6 refer to the relationship between the two entities; i.e. two entities connected by an arrow with one arrow head at one end and a double arrow head at the other end are said to have a "one-to-many" relationship. In a relational database construct, this means that for each parent record in the first entity there may/shall exist many child records in the second entity A glossary of the individual tables of the FAP 14 illustrated in FIGURE 6 is as follows:

FORMS AUTOMATION PLATFORM TABLES

DATA ENTITY NAME	ALIAS	Ref. #
ASSOCIATION INFO	CUSTOMER/CLF ASSOCIATION TABLE	76
CLF PROFILE	CLF MASTER TABLE	77
CUSTOMER PROFILE	CUSTOMER MASTER TABLE	78
DISTRIBUTION INFO	FORM DISTRIBUTION TABLE	79
FIELD DESCRIPTIONS	FORM FIELD DEFINITION TABLE	80
FORM FILENAMES	FORM DISTRIBUTION FILENAMES TABLE	81
FORM PROFILES	FORM MASTER TABLE	82
FORM SW & PRINTER INFO	FORMS SW/PRINTERS TABLE	83
PRINTER IDENTIFIERS	FORM FILE PRINTER TYPES TABLE	84
SYSTEM PARAMETER INFO	FAP SYSTEM PARAMETER TABLE	85

Each file typically has a number of elements, either of the number or character type, having predefined lengths. A listing of the elements, type (characters or numerical), field length, and description of the elements, for each of the tables 76-85 of FIGURE 6 is as follows:

Name: ASSOCIATION INFO; 76

ALIAS: CUSTOMER/CLF ASSOCIATION TABLE

ELEMENT NAME	COLUMN NAME	TYPE	LENGTH	DESCRIPTION
CLF ID	CLF_ID	CHAR	(8)	Uniquely identifies each Central Library Facility.
CUSTOMER IDS	CUST_ID	CHAR	(15)	Customer ID. Uniquely identifies each customer.

PRIMARY KEY:

(CLF_ID, CUST_ID)

INDEXES:

None defined.

RELATIONSHIP TO OTHER TABLES:

DEPENDENT OF:

CUSTOMER MASTER TABLE - CUST_MAST

CLF MASTER TABLE - CLF_MAST

CREATED IN:

FAPDB.SQL script

```
CREATE TABLE CLF_CUST
(
CLF_ID     CHAR    (8),
CUST_ID    CHAR    (15)
)
```

NAME: CLF PROFILE; 77

ALIAS: CLF MASTER TABLE

ELEMENT NAME	COLUMN NAME	TYPE	LENGTH	DESCRIPTION
CLF ID	CLF-ID	CHAR	(8)	Uniquely identifies a Central Library Facility.
CLF DESCRIPTION	CLF_DESC	CHAR	(40)	Description of the Central Library Facility environment.
CLF LOCATION	LOCATION	CHAR	(25)	Description of the Central Library Facility Location.
CLF ADMINISTRATOR	ADMIN	CHAR	(30)	Name of the CLF Administrator.
CLF PHONE NUMBER	PHONE_NO	CHAR	(15)	Phone number of the CLF location.
CLF MODEM NUMBER	MODEM_NO	CHAR	(15)	Modem phone number of the CLF location.
CLF FAX NUMBER	FAX_NO	CHAR	(15)	Fax phone number of the CLF location.

PRIMARY KEY:

(CLF-ID)

INDEXES:

None defined.

RELATIONSHIP TO OTHER TABLES:

PARENT OF:

CUSTOMER/CLF ASSOCIATION TABLE - CLF_CUST

CREATED IN:

FAPDB.SQL script

```
CREATE TABLE CFL_MAST
(
CLF_ID      CHAR      (8),
CLF-DESC    CHAR      (40),
LOCATION    CHAR      (25),
ADMIN       CHAR      (30),
PHONE_NO    CHAR      (15),
MODEM_NO    CHAR      (15),
FAX_NO      CHAR      (15)
);
```

NAME: CUSTOMER PROFILE; 78

ALIAS: CUSTOMER MASTER TABLE

ELEMENT NAME	COLUMN NAME	TYPE	LENGTH	DESCRIPTION
CUSTOMER ID	CUST_ID	CHAR	(15)	Customer Identifier. Uniquely identifies a customer.
CUSTOMER NAME	CUST_NAME	CHAR	(30)	Customer's full name.
FORM PATHNAME	FORM_PATH	CHAR	(75)	Full Pathname on system where customer's forms are locate
NO OF REVISIONS	NO_REVS	NUMBER	(1)	Number of revisions supported on the system for a customer
ADDRESS LINE 1	ADDR1	CHAR	(30)	Street address line 1.
ADDRESS LINE 2	ADDR2	CHAR	(30)	Street address line 2.
CITY	CITY	CHAR	(25)	City address line.
STATE/PROVINCE	STATE	CHAR	(4)	State or province address line.
ZIP	ZIP	CHAR	(10)	Zip code address line.
COUNTRY	COUNTRY	CHAR	(4)	Country address line.
CONTACT NAME	CONTACT	CHAR	(30)	Name of customer contact person.
PHONE NUMBER	PHONE_NO	CHAR	(15)	Phone number of customer.
FAX NUMBER	FAX_NO	CHAR	(15)	Fax phone number of customer.
SHIPPING LINE 1	SHIP_ADDR1	CHAR	(30)	Shipping address line 1.
SHIPPING LINE 2	SHIP_ADDR2	CHAR	(30)	Shipping address line 2.
SHIPPING CITY	SHIP_CITY	CHAR	(25)	Shipping city address line.
SHIPPING STATE/PRO	SHIP-STATE	CHAR	(4)	Shipping state or province line.
SHIPPING ZIP	SHIP_ZIP	CHAR	(10)	Shipping zip code address line.
SHIPPING COUNTRY	SHIP-COUNTRY	CHAR	(4)	Shipping country address line.
SHIPPING ATTENTION	SHIP_ATTN	CHAR	(30)	Name of person for ship-to attention.

PRIMARY KEY:

(CUST_ID)

INDEXES:

None defined.

RELATIONSHIP TO OTHER TABLES:

PARENT OF:

FORM SW & PRINTER INFO TABLE - CUST_MWSW

ASSOCIATION INFO TABLE - CLF_CUST

FORM PROFILE TABLE - FORM_MAST

DEPENDENT OF:

CREATED IN:

FAPDB.SQL script

```
CREATE TABLE CUST_MAST
(
CUST_ID          CHAR        (15),
CUST_NAME        CHAR        (30),
FORM_PATH        CHAR        (75),
NO_REVS          NUMBER      (1),
ADDR1            CHAR        (30),
ADDR2            CHAR        (30),
CITY             CHAR        (25),
STATE            CHAR        (4),
ZIP              CHAR        (10),
COUNTRY          CHAR        (4),
CONTACT          CHAR        (30),
PHONE_NO         CHAR        (15),
FAX_NO           CHAR        (15),
SHIP_ADDR1       CHAR        (30),
SHIP_ADDR2       CHAR        (30),
SHIP_CITY        CHAR        (25),
SHIP_STATE       CHAR        (4),
SHIP_ZIP         CHAR        (10),
SHIP_COUNTRY     CHAR        (4),
SHIP_ATTN        CHAR        (30),
```

NAME: DISTRIBUTION INFO; 79

ALIAS: FORM DISTRIBUTION TABLE

ELEMENT NAME	COLUMN NAME	TYPE	LENGTH	DESCRIPTION
CUSTOMER ID	CUST_ID	CHAR	(15)	Customer Identifier. Uniquely identifies a customer.
CLF ID	CLF_ID	CHAR	(8)	Uniquely identifies a Central Library Facility.
VENDOR FORM ID	FORM_ID	CHAR	(8)	Uniquely identifies a form for a customer.
VENDOR FORM REV	FORM_REV	NUMBER	(1)	Uniquely identifies a revision of a form for a customer.
DIST INDICATOR	DIST_FLAG	CHAR	(1)	Indicates whether or not a form has been selected for distribution to a CLF.
DIST STATUS	DIST_STATUS	CHAR	(1)	Indicates the distribution status of the form.
DIST DATE	DIST_DATE	DATE		Date of distribution to a CLF.
HEADER FILENAME	HDR_FILE	CHAR	(12)	Name of the header file for the form.
DIST FILENAME	DIST_FILE	CHAR	(12)	Name of the packed distribution file for the form.

PRIMARY KEY:

(CUST_ID CLF_ID, FORM_ID, FORM_REV)

INDEXES:

None defined.

RELATIONSHIP TO OTHER TABLES:

None

CREATED IN:

FAPDB.SQL script

```
CREATE TABLE DIST_INFO
(
CUST_ID          CHAR          (15),
CLF_ID           CHAR          (8),
FORM_ID          CHAR          (8),
FORM_REV         NUMBER        (1),
DIST_FLAG        CHAR          (1),
DIST_STATUS      CHAR          (1),
DIST_DATE        DATE,
```

```
HDR_FILE          CHAR        (12),
DIST_FILE         CHAR        (12)
);
```

NAME: FIELD DESCRIPTION; 80

ALIAS: FORM FIELD DEFINITION TABLE

ELEMENT NAME	COLUMN NAME	TYPE	LENGTH	DESCRIPTION
CUSTOMER ID	CUST_ID	CHAR	(15)	,Customer ID. Uniquely identifies a customer.
FORM ID	FORM_ID	CHAR	(8)	Uniquely identifies a form for a customer.
FORM REV	FORM_REV	NUMBER	(1)	Uniquely identifies a revision of a form.
FORM FIELD NUMBER	FLD_NO	NUMBER	(3)	Form field number or tabbing order.
FORM FIELD NAME	FLD_NAME	CHAR	(20)	Form field name.
FORM FIELD LOC	FLD_LOC	CHAR	(20)	Form field coordinate location.
FORM FIELD LENGTH	FLD_LEN	NUMBER	(5)	Form field length.
FORM FIELD TYPE	FLD_TYPE	CHAR	(10)	Form field data type.
FORM FIELD FORMAT	FLD_FORMAT	CHAR	(30)	Form field data format.
FORM FIELD VAL	FLD_VAL	CHAR	(50)	Form field validation.
FORM FIELD CALC	FLD_CALC	CHAR	(80)	Form field calculation.

PRIMARY KEY:

(CUST_ID, FORM_ID, FORM_REV)

INDEXES:

None defined.

RELATIONSHIP TO OTHER TABLES:

DEPENDENT OF:

FORM PROFILE TABLE - FORM_MAST

CREATED IN:

FAPDB.SQL script

```
CREATE TABLE FORM_FLDS
(
```

```
CUST_ID          CHAR        (15),
FORM_ID          CHAR        (8),
FORM_REV         NUMBER      (1),
FLD_NO           NUMBER      (3),
FLD_NAME         CHAR        (20),
FLD_LOC          CHAR        (20),
FLD-LEN          NUMBER      (5),
FLD_TYPE         CHAR        (10),
FLD-FORMAT       CHAR        (30),
FLD_VAL          CHAR        (50),
FLD_CALC         CHAR        (80)
);
```

NAME: FORM FILENAMES; 81

ALIAS: FORM DISTRIBUTION FILENAMES

ELEMENT NAME	COLUMN NAME	TYPE	LENGTH	DESCRIPTION
CUSTOMER ID	CUST_ID	CHAR	(15)	Customer ID. Uniquely identifies a customer.
FORM ID	FORM_ID	CHAR	(8)	Uniquely identifies a form for a customer.
FORM REV	FORM_REV	NUMBER	(1)	Uniquely identifies a form revision for a form.
CLF ID	CLF_ID	CHAR	(8)	Uniquely identifies a Central Library Facility
FORM FILE NAME	FILE_NAME	CHAR	(12)	Form filename including file extension.
FORM FILE TYPE	FILE_TYPE	CHAR	(1)	Form file type.
FORM PRINTER TYPE	FILE_EXT	CHAR	(2)	Type of printer form is designed for.

PRIMARY KEY:

(CUST_ID, FORM_ID, FORM_REV, CLF_ID)

INDEXES:

None defined.

RELATIONSHIP TO OTHER TABLES:

DEPENDENT OF:

FORM PROFILE - FORM_MAST TABLE

CREATED IN:

FAPDB.SQL script

```
CREATE TABLE FORM_FILES
(
CUST_ID          CHAR        (15),
FORM_ID          CHAR        (8),
FORM_REV         NUMBER      (1),
CLF_ID           CHAR        (8),
FILE_NAME        CHAR        (12),
FILE_TYPE        CHAR        (1),
FILE_EXT         CHAR        (2)
);
```

NAME: FORM PROFILE; 82

ALIAS: FORM MASTER TABLE

ELEMENT NAME	COLUMN NAME	TYPE	LENGTH	DESCRIPTION
CUSTOMER ID	CUST_ID	CHAR	(15)	Customer ID. Uniquely identifies a customer.
FORM ID	FORM_ID	CHAR	(8)	Uniquely identifies a form for a customer.
FORM REV	FORM_REV	NUMBER	(1)	Uniquely identifies a revision of a form.
FORM DESCRIPTION	FORM_DESC	CHAR	(40)	Description of form.
FORM CATEGORY	FORM_CAT	CHAR	(10)	Category that form belongs to. NOT USED.
FORM SUB CATEGORY	FORM_SUB	CHAR	(10)	Sub category that form belongs to within category. NOT USED.
FORM PATHNAME	FORM_PATH	CHAR	(75)	Full pathname of directory where form is stored.
FORM DESIGN SW	FORM_SW	CHAR	(8)	Executable name of form design software used.
FORM DESIGN STATUS	FORM_STATUS	CHAR	(1)	Design status of the form.
RELEASE STATUS	REL_STATUS	CHAR	(1)	Release status of the form.
FORM WIDTH	FORM_WDTH	NUMBER	(4, 2)	Width of form.
FORM LENGTH	FORM_LEN	NUMBER	(4, 2)	Length of form
NUMBER OF PAGES	NO_PAGES	NUMBER	(3)	Number of pages in the form.
NUMBER OF PARTS	NO_PARTS	NUMBER	(3)	Number of parts to the form.

DUPLEX INDICATOR	DUPLEX	CHAR	(1)	Indicator of whether or not the form is to be printed duplex.
PAGE ORIENTATION	PG_ORIENT	CHAR	(9)	Page orientation of the form.
FORM CREATION DATE	CREATE_DATE	DATE		System date on which form was created.
CREATOR NAME	CREATE_NAME	CHAR	(10)	Name of person who created form.
FORM MODIF DATE	MOD_DATE	DATE		System date on which form was last modified.
MODIFIER NAME	MOD_NAME	CHAR	(10)	Name of person who last modified form.
FORM RELEASE DATE	REL_DATE	DATE		System date on which form was last released.
RELEASOR NAME	REL_NAME	CHAR	(10)	Name of person who last released form.

PRIMARY KEY:

(CUST_ID, FORM_ID, FORM_REV)

INDEXES:

None defined.

RELATIONSHIP TO OTHER TABLES:

PARENT OF:

FORM FILENAMES TABLE - FORM_FILES

FIELD DESCRIPTIONS TABLE - FORM_FLDS

DEPENDENT OF:

CUSTOMER MASTER TABLE - CUST-MAST

CREATED IN:

FAPDB.SQL script

```
CREATE TABLE FORM_MAST
(
CUST_ID          CHAR          (15),
FORM_ID          CHAR          (8),
FORM_REV         NUMBER        (1),
FORM_DESC        CHAR          (40),
FORM_CAT         CHAR          (10),
FORM_SUS         CHAR          (10),
FORM_PATH        CHAR          (75),
FORM_SW          CHAR          (8),
FORM_STATUS      CHAR          (1),
```

```
    REL_STATUS          CHAR          (1),
    FORM_WDTH           NUMBER        (4, 2),
    FORM_LEN            NUMBER        (4, 2),
    NO_PAGES            NUMBER        (3),
    NO_PARTS            NUMBER        (3),
    DUPLEX              CHAR          (1),
    PG_ORIENT           CHAR          (9),
    CREATE_DATE         DATE,
    CREATE_NAME         CHAR          (10),
    MOD_DATE            DATE,
    MOD_NAME            CHAR          (10),
    REL_DATE            DATE,
    REL_NAME            CHAR          (10)
);
```

NAME: FORMS SW/PRINTERS; 83

ALIAS: FORMS SW/PRINTERS TABLE

ELEMENT NAME	COLUMN NAME	TYPE	LENGTH	DESCRIPTION
CUSTOMER ID	CUST_ID	CHAR	(15)	Customer ID. Uniquely identifies a customer.
HW/SW INDICATOR	HWSW_TYPE	CHAR	(1)	Indicates whether entry is hardware (printer) or software.
HW/SW NAME	HWSW_NAME	CHAR	(8)	Executable or invokable name of hardware of software.
HW/SW DESCRIPTION	HWSW_DESC	CHAR	(40)	Description of hardware or software.

PRIMARY KEY:

(CLF_ID, CUST_ID)

INDEXES:

None defined.

RELATIONSHIP TO OTHER TABLES:

DEPENDENT OF:

CUSTOMER MASTER TABLE - CUST_MAST

CREATED IN:

FAPDB.SQL script

```
CREATE TABLE CUST_HWSW
(
CUST_ID          CHAR          (15),
HWSW_TYPE        CHAR          (1),
HWSW_NAME        CHAR          (8),
HWSW_DESC        CHAR          (40)
);
```

NAME: PRINTER IDENTIFIERS; 84

ALIAS: PRINTER TYPE TABLE

ELEMENT NAME	COLUMN NAME	TYPE	LENGTH	DESCRIPTION
FORM SW NAME	FORM_SW	CHAR	(8)	Form software executable name.
FORM FILE TYPE	FILE_TYPE	CHAR	(1)	Form software file type.
PRINTER TYPE	FILE_EXT	CHAR	(2)	Printer type supported in form software.

PRIMARY KEY:

(FORM_SW)

INDEXES:

None defined.

RELATIONSHIP TO OTHER TABLES:

PARENT OF:

FORM FILENAMES TABLE - FORM_FILES

DEPENDENT OF:

CREATED IN:

FAPDB.SQL script

```
CREATE TABLE FILE_EXT
(
FORM_SW          CHAR          (8),
FILE_TYPE        CHAR          (1),
```

```
    FILE_EXT        CHAR        (2)
    );
```

NAME: SYSTEM PARAMETER INFO; 85

ALIAS: FAP SYSTEM PARAMETER TABLE

ELEMENT NAME	COLUMN NAME	TYPE	LENGTH	DESCRIPTION
FAP ID	FAP_ID	CHAR	(8)	Uniquely identifies a Forms Automation Platform.
FAP DESCRIPTION	FAP_DESC	CHAR	(40)	Description of the Forms Automation Platform environment.
FAP LOCATION	FAP_LOC	CHAR	(20)	Location for Forms Automation Platform.
FAP ADMINISTRATOR	ADMIN	CHAR	(30)	Name of the Forms Automation Platform Administrator.
FAP PHONE NUMBER	PHONE_NO	CHAR	(15)	Forms Automation Platform location phone number.
FAP MODEM NUMBER	MODEM_NO	CHAR	(15)	Forms Automation Platform modem phone number.
FAP FAX NUMBER	FAX_NO	CHAR	(15)	Forms Automation Platform fax phone number.
NUMBER OF REVS	NO_REVS	NUMBER	(1)	Number of form revisions supported on a Forms Automation Platform.

PRIMARY KEY:

(FAP_ID)

INDEXES:

None defined.

RELATIONSHIP TO OTHER TABLES:

None

CREATED IN:

FAPDB.SQL script

```
CREATE TABLE SYS_PARAMS
(
FAP_ID          CHAR        (8),
FAP_DESC        CHAR        (40),
FAP_LOC         CHAR        (20),
ADMIN           CHAR        (30),
PHONE_NO        CHAR        (15),
```

```
MODEM_NO        CHAR        (15),
FAX_NO          CHAR        (15),
NO_REVS         NUMBER      (1)
);
```

FIGURE 7 is a data flow diagram for the FAP 14. Utility, report generation, archiving, form maintenance, profile maintenance, and CLF 12 updating functions are provided, as illustrated in FIGURE 7. The interrelationships between the various components as shown in FIGURE 7 are more fully indicated by FIGURES 8a-8e.

FIGURE 9 provides a flow chart indicating the general steps executed by FAP 14 for accessing the CLF 12 from the FAP to transfer form information. The program is initiated from a command file, as indicated at 100 A session with a target CLF 12 is allocated. This step is indicated since typically a vendor's FAP 14 can be associated with more than one CLF 12, for example a centralized location for the FAP 14 may serve a number of CLFs 12, one associated with each different customer (each customer having a plurality of geographically remote user stations). At 102, the files indicated for transfer are transferred from the FAP 14 to the targeted CLF 12, and confirmation is provided at 13. Then the remote CLF table population function is initiated at 104, and when that function is completed it is confirmed at 105. Data may then be sent to and from the CLF 12 from and to the FAP 14 at 106, for example data useful for determining the status of the forms. An acknowledgement is issued at 107, and any post completion processing done at 108 before the processing ends.

As illustrated in FIGURE 10, the CLF 12 preferably communicates via modems 41 with the FAP 14, or token ring if located in the same facility, and via modems 42 with the host computer 34. In order to provide human interface, a terminal 143 having a video display 144 and a keyboard 145 and/or mouse 146, is provided associated with the CLF 12. Other technologies could also be utilized, such as optical disks, and the like, to store the forms on either magnetic or optical media.

As illustrated schematically in FIGURE 3, major functions of the CLF 12 are forms management and distribution. The application software 29 creates, maintains, up-dates and ensures the integrity of the database 29 provided by CLF 12. The CLF 12 also processes end user requests inputted by device 143 (e.g. via the various electronic communications facilities already discussed), and distributes electronic forms to all of the user locations 15. Inherent in the CLF 12 is restricted user access based on security levels, the production of desired reports to support the customer's requirements, sorting of the contents of the library based upon user specified parameters, and up-dated processing. At the CLF a search will be conducted of the electronic forms database 29 on a predetermined basis, to determine all forms scheduled for release on a specified date. The forms will then be distributed based upon the end user profiles which have been designated. The CLF 12 is a logical entity, and its processes may be distributed over one or more processors, either directly on the customer's main frame 34, or at the vendor's facility, utilizing a file server, or the like.

User interface software executed by CLF 12 is menu driven in the preferred embodiment. The major menu items provided to the user of the CLF 12 main menu screen utilizing terminal 143 are forms, profile management, distribution management, release function, queries and report, and utilities A typical main menu screen is as follows:

```
                CENTRAL LIBRARY FACILITY
                        MAIN MENU
     Enter the Capital Letter of the Item Below and
Press Enter-> --
                 Forms management
                 Profile management
                 Distribution management
                 Release function
                 Queries and reports
                 Utilities
F3=EXIT
```

The first item of selection is "Forms management". The Forms management menu typically appears as follows:

```
                CENTRAL LIBRARY FACILITY
                  FORMS MANAGEMENT MENU
     Enter the Capital Letter of the Item Below and
Press Enter-> --
                 List/delete/update forms
                 Field information list
                 Output format list
                 Print form
F2=REFRESH  F3=EXIT
```

The first selectable item from the Forms management menu is the forms list. A forms list screen, showing descriptions and other information of a few exemplary forms might appear as follows:

```
                                CENTRAL LIBRARY FACILITY

                                    FORMS LIST

     Type a P in the action column to print and press PF4.

                                  Revision   Release    Creation
Action Form Id     Status          Date       Date       Date      Forms Description

__ CSADRTIN        CUR             -          -          -         CUSTOMER ADDRESS & TI
__ CSDEMOGR        CUR             -          -          -         DEMOGRAPHIC INFORMATI
__ CSSGNCRD        CUR             -          -          -         SIGNATURE CARD
__ CSUNIVER        CUR             -          -          -         UNIVERSAL FORM
__
__
__

F3=EXIT  F4=QUEUE PRINT
```

The last of the selectable items in the Forms management menu is the forms print selection, the screen for which might appear as follows:

```
                                CENTRAL LIBRARY FACILITY

                                    PRINT FORMS

     Enter number of copies and destination for each form     More:     +

                                    NUMBER     PRINTER     SITE      CANCEL
FORM ID      FORM DESCRIPTION       COPIES       ID        ID        PRINT
CSSGNCRD     SIGNATURE CARD                                          N

PF3=EXIT   PF4=PROCESS REQUEST   PF8=NEXT FORM
```

By filling information into the prompt sections of this screen, an operator of CLF terminal 43 can schedule printing of a desired number of copies of specific forms to a desired printer at a desired use location.

The second menu item in the main menu is the profile management option. The typical profile management menu screen appears as follows:

```
                    CENTRAL LIBRARY FACILITY
                     PROFILE MANAGEMENT MENU
          Enter the Capital Letter of the Item Below and
     Press Enter->

                          User profile
                          Category profile
                          Site profile
                          corporate proFile
                          Geographic profile
                          cusTomer profile
                          grOup profile
                          Printer profile

     F2=REFRESH    F3=EXIT
```

The first selectable item of the profile management menu is the user profile, a screen of which appears as follows:

```
                                   USER PROFILE
Update/Delete:  Type "U" and/or "D" in ACTION column and press "ENTER"
Add:  Press F4; Associations:  Type an "S" i ACTION column and press F6
ACT      USER      USER NAME      CORP      GEO.      ****** LOCK OUT ******
          ID                        ID        ID      FLAG   DATE     TIME
-        TOM       Tom
-        CLA       Cristie        111                 Y 12-10-1990 10:10:10
-        DLY       Donna
-        FEA       Fran
-        JOE       Joe              111 , 232
-        JZA       Julie
-        SAM       SAM

D002    ****    END OF OUTPUT    ****
 F2-REFRESH F3-EXIT F4-ADD
 -------------------------
```

If F4 is actuated from the above screen, then the following screen appears:

```
                                USER PROFILE ADD
        Enter Data in all fields -- THEN press "ENTER"

User ID ......: _____                    User Name ..: _____________________
Corporate ID..: _____
Geographic ID.: _____
Telephone No..: _____________ Distribution Tickler Flag .._ Amin. flag. _
**********************************Lock Out Data****************************************
Lock Out Date: _________ Lock Out Time: _____________   Lock Out Flag.:_

version 0.1
.ekF2=REFRESH F3=EXIT
```

The third selectable item from the profile management menu is the site profile. The site profile screen appears as follows:

```
                                CENTRAL LIBRARY FACILITY
                                     SITE PROFILE

Customer ID:        2-4561686-00000
Customer Name:      State Bank

Site ID    Site Description          Geographic ID    Network ID
FLA001     Tampa Banking Dept        TPA001           FLATPA01
GEO001     Atlanta Branch            ATL001           GEOATL01
NYC002     New York Branch           NYC001           NYNYC02
CHI003     Chicago Branch            CHI001           ILCHI01
SCA001     South Carolina Office     CAE001           SCACAE01
PF3=EXIT
-------------
```

The sixth menu item on the profile management menu screen is the customer profile. When that menu item is selected, the customer profile screen typically appears as follows:

CENTRAL LIBRARY FACILITY
CUSTOMER PROFILE

Customer ID:	2-4561686-00000
Customer Name:	State Bank
Address:	The American Road
	Atlanta
	GA 30123 USA
Contact Name:	Don Jones
Phone Number:	800-321-1234

PF3=EXIT

The Group profile of groups list item provides the following exemplary screen:

GROUPS LIST

UPDATE/DELETE: Type U and/or D in action column and press Enter. ADD: Press F4;
ASSOCIATION: Type an S in action column and press F6.

Action	Group ID	Seq. #	Group Description
-	G1	1	Test 1
-	G2	1	Test 2
-	G2	2	Test 3
-	G3	1	Test 4
-	G3	2	Test 5
-	G3	3	Test 6
-	GRP101	1	New Group Added
-	MRC001	1	First MRC Group

D002 ***** END OF OUTPUT *****

F3=EXIT F4=ADD F6=ASSOCIATIONS F12=CANCEL

If F4 is actuated from the above screen, then the following exemplary screen appears.

```
                                ADD DISTRIBUTION GROUP
        Type in entries for the distribution group and press <Enter> to add.
                Group Id . . . . . . . _______

                Sequence Number  . . . __

                Group Description  . . _____________________
        F3-EXIT                                                  F12-Cancel
        ------------------
```

If F6 is actuated from the Groups list screen, then the following appears:

```
                                ASSOCIATION MENU
        Type the Id of a base item and press <Enter>, OR type an "S" and press <Enter> for a
        selection listing of the base item.

        ______________

        Base Item              Id          Association Items
        _FORM .....            _______     _GROUPS
        _GROUP ID .....        _______     _FORMS          _SITES
        SEQ. NUMBER ...        ___
        _USER .....            _______     _SITES
        _SITE .....            _______     _USERS          _PRINTERS
                                           _GROUPS
        _PRINTER .....         _______     _SITES

                F3-Exit                                  F12-Cancel
        ______________
```

Upon insertion of a particular group ID from the groups list screen (e.g. "G1"), the following exemplary screen appears:

```
                                SITES ASSOCIATED WITH A GROUP
Group ID: G1     SEQ:   1       DESC:  TEST 1
ADD:  Press F4; DELETE:  Type a "D" in action column and press <Enter>.
ACT   SITE      DESCRIPTION          CORP     GEO.      MODEM TELEPHONE     NET
        ID                             ID       ID                          ID
_     KANSAS    KANSAS
_     S1
_     SITI01    NEW SITE ADDED
_     WISC      WISCONSIN

D002      ****     END OF OUTPUT     *****
        F3-EXIT          F4-ADD                  F12-CANCEL
```

If F4 is actuated from the above screen, then the following exemplary screen appears, to support data entry to get sites associated with a group:

```
                          ADD SITES ASSOCIATED WITH A GROUP
To add items to the association list, type one or more "S" in      MORE:     +
the action column and press <Enter>.
ACT   SITE      DESCRIPTION          CORP     GEO.      MODEM TELEPHONE     NET
        ID                             ID       ID                          ID
-     ALA       ALABAMA
_     CALIF     CALIFORNIA
_     COLO      COLORADO                                                    COLNET
_     FLA       FLORIDA                                                     FLANET
_     KANSAS    KANSAS
_     MASS      MASSACHUSETTS
-     MICH      MICHIGAN
_     MINN      MINNESOTA                          555432100000000000
_     S1
_     S2
_     S3
_     SITI01    NEW SITE ADDED 12-1-90

F3-EXIT                          F8-FWD                  F12-CANCEL
```

The last selectable item on the profile management menu is the printer profile option. When the printer profile option is selected, the screen that typically appears is as follows:

```
                    CENTRAL LIBRARY FACILITY
                        PRINTER PROFILE
     Customer ID:       2-4561686-00000
     Customer Name:     State Bank
     Printer ID   Printer Type     Printer Manufacturer Name

     01               PS           Adobe PostScript
     02               HP           Hewlett Packard LaserJet
     03               AF           IBM 3800 Printers
     04               AF           IBM 4019 Printer
     05               MF           XEROX 9700 Printer

     PF3=EXIT
```

The third selectable item on the main menu is the distribution management function. If that function is selected, the screen that typically appears is as follows:

```
                    CENTRAL LIBRARY FACILITY
                        DISTRIBUTION MENU
          Enter the Capital Letter of the Item Below and
     Press Enter-> __
                     New form distribution cycle
                     Add form distribution
                     Delete form distribution
     FS=REFRESH      F3=EXIT
```

The fourth selectable item on the main menu is the release function. If that function is selected, the screen that typically would appear is as follows:

```
                        CENTRAL LIBRARY FACILITY
                           RELEASE FORMS MENU
               Enter the Capital Letter of the Item Below
          Press Enter -> __
                          Release forms to site
                          Automatic release
                          release From remote site
          F2=REFRESH      F3=EXIT
```

The first selectable item on the release forms menu is to release the form to desired sites. If that item is selected, the typical screen that would appear is as follows:

```
                    CENTRAL LIBRARY FACILITY
                        RELEASE TO SITES
     Do you wish to release New/revised forms (N) or
All forms (A)?
                        Enter Selection here (N, A) > __
     Also select one of the choices below:

     ___Release All Forms to All Sites
     ___Release All Forms for Specific Site(s)
     ___Release Specific Forms(s) to All Sites
     ___Release Specific Form(s) to Specific Sites
F2=Refresh    F3=Exit
```

The above provides a description for the major screens that appear in the implementation of the CLF 12 functions, although other screens are provided too, for example customer specific screens depending upon what queries and reports are desired, and conventional utilities functions.

FIGURE 11 is a data model diagram for the CLF 12. The individual components illustrated in FIGURE 11 are individual files which have particular elements or records therein in predefined fields and with predefined addresses. The bare essentials of the system are contained within the dotted lines, but the other files are also important for ultimate maximum utilization. The connections in FIGURE 11 refer to the relationship between the two entities; i.e. two entities connected by an arrow with one arrow head at one end and a double arrow head at the other end are said to have a "one-to-many" relationship. In a relational database construct, this means that for each parent record in the first entity there may/shall exist many child records in the second entity. In the preferred embodiment, the various files have the following major elements:

The customer profile file 150 contains all relevant information about the customer. The configuration of that file is as follow:

TABLE NAME: CUSTOMER PROFILE ALIAS: CP

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID	CP_CUS_ID	1	006	Uniquely identifies each customer.
Country Indicator	CP_MBF_CTRY_ID	E	001	Country indicator for the customer ID.
Customer ID	CP_MBF_ID	E	015	Corporate identifier for a customer.
Customer Name	CP-NME	E	030	Name of customer.
ADDR1	CP_ADR_1	E	030	Street address one.
ADDR2	CP_ADR_2	E	030	Street address two.
City	CP_CTY	E	030	Name of city.
State Prov	CP_STE	E	004	State or province abbreviation.
Zip	CP_ZIP	E	010	The customer's zip code (U.S.) or postal code.
Country	CP_CTRY	E	004	Name of country in which the customer is located.
Num Versions	CP_NBR_ARC	E	001	Number of archived form versions to keep.
Contact Name	CP_CTC	E	030	Name of the contact person at the customer location.
Contact Phone	CP_CTC_TEL	E	015	Phone number of the customer contact person.
Customer Status	CP_STA_COE	E	001	Current CLF customer status 'D' = deleted 'A' = Active
Customer Status Date	CP_STA_DTE	E	008	Date of status change for customer
CLF ID	CP_CLF_ID	E	010	A unique identifier for each customer's CLF
Num Levels	CP_NBR_LVL	E	001	The number of corporate organization levels to be used
Level Name 1	CP_CORP_LVL_1	E	015	First name for corporate level definition
Level Name 2	CP_CORP_LVL_2	E	015	Second name for corporate level definition
Level Name 3	CP_CORP_LVL_3	E	015	Third name for corporate level definition

Key Data:

Primary Key (CLF Customer ID)

Indexes:

Name	On Columns	Type of Work
Cusidx	CLF Customer ID	Primary, Ascending, Unique

Relationship to Other Tables:

Parent of: Form Profile
Category Profile
Printer Profile
Corporate Profile
Geographic Profile
User Profile
Site Profile
Group Profile All Tables are Access Thru CLF Customer ID

As many corporate level definitions may be provided as is necessary in order to meet the customer's needs.

The corporate profile provides a file 151 for the customer to charge back the forms to various entities within the organization. This file typically has the same number of levels as the number of levels for the corporate level definition in the customer profile file 150. An exemplary corporate profile file 151 is as follows:

TABLE NAME: CORPORATE PROFILE ALIAS: CO

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID		1	006	Uniquely identifies each customer.
Corporate ID		2	006	Code for each different corporate profile for a customer
Level 1		E	020	Highest level in corporate organization.
Level 2		E	020	Second highest level in corporate organization.
Level 3		E	020	Third highest level in corporate organization.

Key Data:

Primary Key (CLF Customer ID, Corporate ID)

Foreign Key FK_CORPA (CLF Customer ID)
References Customer Profile
on Delete Cascade;

Indexes:

Name	On Columns	Type of Index
CORPIDX	CLF Customer ID	Primary, Ascending, Unique
	Corporate ID	

Relationship to Other Tables:

Parent of: User Profile Thru CLF Customer ID, Corporate ID
Site Profile Thru CLF Customer ID, Corporate ID

Dependent of: Customer Profile Thru CLF Customer ID

The geographic profile file 152 has data for the various geographically remote user locations, such as branches, offices, etc. A typical geographical profile file 152 is configured as follows:

TABLE NAME: GEOGRAPHIC PROFILE ALIAS: GP

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID		1	006	Uniquely identifies each customer.
Geographic ID		2	006	Unique Code for each different geographic profile used
SMSA-Code		E	003	
Country Name		E	004	Name of Country (International Code).
Region Name		E	020	Name of Region.
State/Province Name		E	004	Name of State or Province.
State Region Name		E	020	Name of Region within a State or Province.
City Name		E	030	Name of City.
City Region Name		E	030	Name of Region within City.
Building/Branch ID		E	015	Code to Identify a Building or Branch.
Floor Number		E	003	Number of the Floor in the Building.

Key Data:

Primary Key (CLF Customer ID, Geographic ID)

Foreign Key FK_GEOA (CLF Customer ID)

References Customer Profile

on Delete Cascade;

INDEXES:

Name	On Columns	Type of Index
GEOIDX	CLF CUSTOMER ID GEOGRAPHIC ID	PRIMARY, ASCENDING, UNIQUE

Relationship to other Tables:

Parent of: User Profile Thru CLF Customer ID, Geographic ID

Site Profile Thru CLF Customer ID, Geographic ID

Dependent of: Customer Profile Thru CLF Customer ID

The security table 153 limits access to the various files in the data model of FIGURE 11 to ensure that only people with the appropriate responsibility can command the system to perform important functions. The typical configuration of the security table 153 is as follows:

TABLE NAME: SECURITY ALIAS: SE

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID		1	006	Uniquely identifies each customer.
User ID		2	006	The Logon ID associated with each CLF user.
Password		3	006	The Password associated with each user ID.
Security Funct		E	001	The Authority to maintain the security table.
Prof Mgmt Funct		E	001	The Authority to maintain profile tables.
Form Mgmt Funct		E	001	The Authority to maintain the central forms library.
Dist Funct		E	001	The Authority to control form distribution to end sites
Release Funct		E	001	The Authority to release forms to the end user site.
Report Funct		E	001	The Ability to produce reports.
Security Level		E	001	Defines the level of authority for each user.
Distribution Tickler Flag		E	001	Flag to indicate if new forms have arrived in the system.

Key Data:

Primary Key (CLF Customer ID, User ID, Password)

Foreign Key FK_Sea (CLF Customer ID, User ID)
References User Profile
On Delete Cascade;

Indexes:

Name	On Columns	Type of Work
SEIDX	CLF Customer ID	Primary, Ascending, Unique
	User ID	
	Password	

Relationship to Other Tables:

Dependent of: User Profile Thru CLF Customer ID, User ID

The user profile file 154 describes the end user, and it is interrelated with the security table 153 A typical configuration of the user profile file 154 is as follows:

TABLE NAME: USER PROFILE ALIAS: UP

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID		1	006	Uniquely identifies each customer.
User ID		2	006	The Logon ID associated with each CLF user.
User Name		E	030	Name of User.
User Phone		E	015	Telephone number of user.
Lock Out Flag		E	001	Indicator which allows or prevents a user from signing on.
Lock Out Date		E	002	Date a user's ID is locked due to invalid access attempts.
Lock Out Time		E	008	Time a user's ID is locked due to invalid access attempts.
Corporate ID		E	006	Code for each different corporate profile for a customer.
Geographic ID		E	006	Unique code for each different geographic profile used.
Distribution Tickler Flag		E	001	Flag to indicate new forms have arrived in the database.

Key Data:

Primary Key (CLF Customer ID, User ID)

Foreign Key FK_USERA (CLF Customer ID, Corporate ID)
References Corporate Profile
On Delete Restrict;

Foreign Key FK_USERB (CLF Customer ID, Geographic ID)
References Geographic Profile
On Delete Restrict;

Foreign Key FK_USERC (CLF Customer ID)
References Customer Profile
On Delete Restrict;

Indexes:

Name	On Columns	Type of Index
USERIDX	CLF Customer ID User ID	Primary, Ascending, Unique
USERIDXA	CLF Customer ID Corporate ID	Ascending
USERIDXB	CLF Customer ID Geographic ID	Ascending

Relationship to Other Tables:

Parent of: User/Site Thru CLF Customer ID, Site
Security Thru CLF Customer ID, User ID

Dependent of: Customer Profile thru CLF Customer ID
Corporate Profile thru CLF Customer ID, Corporate ID
Geographic Profile thru CLF Customer ID, Geographic ID

The site profile 155 is interrelated with the geographic and corporate profiles. A file in the site profile 155 is provided for each user location. Typically hardware, such as a printer 16 and/or a PC (e.g. 94, at 15), is provided at the geographically remote user locations which correspond to the files in the site profile 155. A typical configuration of the site profile file 155 is as follows:

TABLE NAME: SITE PROFILE ALIAS: ST

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID	ST_CLF_CUS_ID	1	006	Uniquely identifies each customer.
Site ID	ST_SITE_ID	2	006	Identifier to uniquely identify a site for a customer
Site Description	ST_DESCRIPTION	E	030	Description of site
Corporate ID	ST_CORP_ID	E	006	Code for each different corporate profile for a customer
Geographic ID	ST_GEO_ID	E	006	Unique code for each different geographic profile used
Modem Phone	ST_MODEM_TEL	E	015	The phone number to be dialed for communications.
Network ID	ST_NETWORK_ID	E	004	The physical communication identifier
Data Type	ST_CHR_TYP	E	001	Code to indicate if the site is ASCII or EBCIDIC data type

Key Data:

Primary Key (CLF Customer ID, Site ID)

Foreign Key FK_SITEA (CLF Customer ID)
References Customer Profile
On Delete Restrict;

Foreign Key FK_SITEB (CLF Customer ID, Corporate ID)
References Corporate Profile
On Delete Restrict;

Foreign Key FK_SITEC (CLF Customer ID, Geographic ID)
References Geographic Profile
On Delete Restrict;

Indexes:

Name	On Columns	Type of Work
SITEIDX	CLF Customer ID	Primary, Ascending, Unique
	Site ID	
SITEIDXA	CLF Customer ID	Ascending
	Corporate ID	
SITEIDXB	CLF Customer ID	Ascending
	Geographic ID	

Relationship to Other Tables:

Parent of: User/Site Profile thru CLF Customer ID, Site ID

		Site/Printer Profile thru CLF Customer ID, Site ID
		Site/Group Profile thru CLF Customer ID, Site ID
	Dependent of:	Customer Profile thru CLF Customer ID
		Corporate Profile thru CLF Customer ID, Corporate ID
		Geographic Profile thru CLF Customer ID, Geographic ID

Interrelated with the user profile 154 and the site profile 155 is the user/site data file 156. This relates a user to a site; a user can only access forms and perform functions as they relate to their accelerated site. A typical configuration of element 156 is as follows:

TABLE NAME: SITE/USER DATA ALIAS: SU

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID		1	006	Uniquely identifies each customer.
Site ID		2	006	Identifier to uniquely identify a site for a customer
User ID		3	006	The Logon ID associated with each CLF user.

Key Data:

Primary Key (CLF Customer ID, Site ID, User ID)

Foreign Key FK_SUA (CLF Customer ID, User ID)
References User Profile
On Delete Cascade;

Foreign Key FK_SUB (Clf Customer ID, Site ID)
References Site Profile
On Delete Cascade;

Indexes:

Name	On Columns	Type of Index
SUIDX	CLF Customer ID	Primary, Ascending, Unique
	Site ID	
	User ID	
SUIDXA	CLF Customer ID	Ascending
	User ID	
SUIDXB	CLF Customer ID	Ascending
	Site ID	

Relationship to Other Tables:

Dependent of:	User Profile thru CLF Customer ID, User ID
	Site Profile thru CLF Customer ID, Site ID

The group profile file 157 relates to groups of forms. A group is a particular combination of electronic forms, i.e. a segmentation scheme for the forms, grouped for the purpose of distribution to sites or different organizations. A typical configuration of the group profile file 157 is as follows:

TABLE NAME: GROUP PROFILE ALIAS: GR

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID	GR_CLF_CUS_ID	1	006	Uniquely identifies each customer.
Group ID	GR_GRP_ID	2	006	Code to uniquely identify the distribution group.
Group Sequence Number	GR_GRP_SEQ_NBR	3	003	Sequence number to control level within a group.
Group Description	GR-GRP_DSC	E	030	Description of the distribution group.

Key Data:

Primary Key (CLF Customer ID, Group ID, Group Sequence Number)

Foreign Key FK_GRPA (CLF Customer ID)
References Customer Profile
On Delete Cascade;

Indexes:

Name	On Columns	Type of Index
GRPIDX	CLF Customer ID	Primary, Ascending, Unique
	Group ID	
	Group Sequence Number	

Relationship to Other Tables:

Parent of: Site/Group thru CLF Customer ID, Group ID, Group Sequence Number

Group/Form thru CLF Customer ID, Group ID, Group Sequence Number

Dependent of: Customer Profile thru CLF Customer ID

Interfacing between the site profile 155 and the group profile 157 is the site/group data file 158. This assigns a group to a site -- i.e. specific groups of forms are distributed to the sites they are associated with A typical configuration of the file 158 is as follows:

TABLE NAME: SITE/GROUP DATA ALIAS: SG

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID	SG_CLF_CUS-ID	1	006	Uniquely identifies each customer.
Site ID	SG_SITE_ID	2	006	Identifier to uniquely identify a site for a custone:
Group ID	SG_GRP_ID	3	006	Code to uniquely identify the distribution group
Group Sequence Number	SG_GRP_SEQ_NBR	4	003	Sequence number to control level within a group

Key Data:

Primary Key (CLF Customer ID, Site ID, Group ID, Group Sequence Number)

Foreign Key FK_SGA (CLF Customer ID, Site ID)
References Site Profile
On Delete Cascade;

Foreign Key FK_SGB (CLF Customer ID, Site ID)
References Group Profile
On Delete Cascade;

Indexes:

Name	On Columns	Type of Index
SGIDX	CLF Customer ID	Primary, Ascending, Unique
	Site ID	
	Group ID	
	Group Sequence Number	
SGIDXA	CLF Customer ID	Ascending
	Site ID	
SGIDXB	CLF Customer ID	Ascending
	Group ID	
	Group Sequence Number	

Relationship to Other Tables:

Dependent of: Site Profile thru CLF Customer ID, Site ID
Group Profile thru CLF Customer ID, Group ID, Group Sequence Number

The printer profile file 159 has information regarding the model and manufacture of each of the printers that will be controlled by the computers of the system 10. The typical configuration of the printer profile file 159 is as follows:

TABLE NAME: PRINTER PROFILE ALIAS: PP

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID	PP_CLF_CUS_ID	1	006	Uniquely identifies each customer.
Printer ID	PP_PTR_ID	2	006	Code to uniquely identify each printer.
Printer Type	PP_PTR_TYP	E	002	Code of printer type (see list below).
Printer Type Description	PP_PTR_DSC	E	015	Description of the printer and printer type
Printer MFR Name	PP_PTR_MFR_NME	E	020	Name of printer manufacturer

Key Data:

Primary Key (CLF Customer ID, Printer ID)

Foreign Key FK_PTRA (CLF Customer ID)
References Customer Profile
On Delete Cascade;

Indexes:

Name	On Columns	Type of Index
PTRIDX	CLF Customer ID Printer ID	Primary, Ascending, Unique

Relationship to Other Tables:

Parent of: Site/Printer Thru CLF Customer ID, Printer ID

Dependent of: Customer Profile thru CLF Customer ID

Printer Type Codes:

Code	Description
HP	HP PCL
H5	HP PCL 5
AF	AFP
MF	META FILE
DT	DOT MATRIX
XC	XICS
PS	POSTSCRIPT
DC	DOT MATRIX COLOR

Interrelated with the site profile file 155 and the printer profile file 159 is the site/printer data file 160. Some forms will be printed at the user sites, while other forms will be printed by the vendor. The site/printer data file 160 is utilized only for those forms which will be printed by the user at the user's locations, which printers (e.g. 16) may have different printer formats. A typical configuration of the site/printer data file 160 is as follows:

TABLE NAME: SITE/PRINTER DATA ALIAS: SP

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID	SP_CLF_CUS_ID	1	006	Uniquely identifies each customer
Site ID	SP_SITE_ID	2	006	Identifier to uniquely identify a site for a customer
Printer ID	SP_PTR_ID	3	006	Identifier to uniquely identify a printer
Printer Type	SP-PTR-TYP	4	002	Code of printer type (see list below under printer profile)

Key Data:

Primary Key (CLF Customer ID, Site ID, Printer Type)

Foreign Key FK_SPA (CLF Customer ID, Site ID)
References Site Profile
On Delete Cascade;

Foreign Key FK-SPB (CLF Customer ID, Printer ID)
References Printer Profile
On Delete Cascade;

Indexes:

Name	On Columns	Type of Index
SPIDX	CLF Customer ID	Primary, Ascending, Unique
	Site ID	
	Printer ID	
SPIDXA	CLF Customer ID	Ascending
	Site ID	
SPIDXB	CLF Customer ID	Ascending
	Printer ID	

Relationship to Other Tables:

Parent of: Distribution Profile thru CLF Customer ID, Site ID, Printer ID

Dependent of: Printer Profile thru CLF Customer ID, Printer ID
Site Profile Thru CLF Customer ID, Site ID

The distribution data file 161 is interrelated to the site/printer data file 160 and the form profile data file 162. The typical configuration of the distribution data file 161 is as follows:

TABLE NAME: DISTRIBUTION PROFILE ALIAS: DP

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID	DP_CLF_CUS_ID	1	006	Uniquely identifies each customer
FORM ID	DP_FRM_ID	2	008	Code to uniquely identify a form for a customer
SITE ID	DP_SIT_ID	3	006	Identifier to uniquely identify a site for a customer
Printer Type	DP_PTR_TYPE	4	002	Code of printer type (see list on printer profile)
Printer ID	DP_PTR_ID	5	006	Code to uniquely identify a printer
Release Code	SP_RLS_CDE	E	001	Code to indicate release action (see list below)
Xmit Date	DP_XMIT-DTE	E	008	Date the form was transmitted (released) to the site

Key Data:

Primary Key (CLF Customer ID, Form ID, Site ID, Printer ID)

Foreign Key FK_DPA (CLF Customer ID, Form ID)

References Form Profile

on Delete Cascade;

Foreign Key FK_DPB (CLF Customer ID, Site ID, Printer ID, Printer Type)

References Site/Printer Data

On Delete Cascade;

Indexes:

Name	On Columns	Type of Index
DPIDX	CLF Customer ID	Primary, Ascending, Unique
	Form ID	
	Site ID	
	Printer ID	
DPIDXA	CLF Customer ID	Ascending
	Form ID	
DPIDXB	CLF Customer ID	Ascending
	Site ID	

	Printer ID	
	Printer Type	
DPIDXC	CLF Customer ID	Ascending
	Printer Type	

Relationship to Other Tables:

Dependent of: Site/Printer Data thru CLF Customer ID, Site ID, Printer ID

Form Profile thru CLF Customer ID, Form ID

Release Codes:

Code	Description
0	Form is current
1	Form is new to distribution
2	Forms has been revised
9	Form is inactive (logically deleted)

The form profile data file 162 has stored therein the elements of each form and characteristics of the form, e.g. descriptive information. Typically, a number of electronic forms will be stored therein that are identical except for printer formatting since it is necessary to be able to print the same form on a number of different types of printers. The necessary elements for recordation of each form include a unique identifier, a description of the form, the name of the software package (e.g. DOCS) used to design the form, a code to indicate whether the form is new or revised, when the form was created and/or last revised, when the form is to be released and/or the previous release dates, the number of parts to the form, the code to identify whether it has a landscape or portrait orientation, the length of the form, and the width of the form. A typical configuration of the form profile data file 162 is as follows:

TABLE NAME: FORM PROFILE ALIAS: FP

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID	FP_CLF_CUS_ID	1	006	Uniquely identifies each customer.
Form ID	FP_FORM_ID	2	008	Code to uniquely identify a form for a customer.
Form Sub ID	FP_FRM_SUB_ID	3	003	Code to uniquely identify each revision of the fo:
Customer Catalog Number	FP_CUS_CAT_NBR	E	015	Customers number to identify the form.
Form Description	FP-Description	E	030	Description of form.
Form Design Software	FP_Design_SFW	E	010	Software package used to design the form.
Form Status Code	FP_STA_CDE	E	001	Code to indicate that the form is new or revised.
Form Creation Date	FP_CRE-DATE	E	010	Date form was created (from FAP).
Form Revision Date	FP_REV_DATE	E	010	Date form was last revised (from FAP).
Form Release Date	FP_RLS_DATE	E	010	Date the form is to be released to users.
Prior Release Date	FP_OLD_RLS_DTE	E	010	Date of the previous release date
Category ID	FP_CTG_ID	E	010	Code of form category to which a form is assigned
FAP ID	FP_FAP_ID	E	010	Unique identifier of the FAP that created the form.
FAP Phone Modem Number	FP_FAP_TEL_MODEM	E	015	Telephone number of the FAP modem.
Number of Parts	FP_NBR_PRT	E	003	Number of parts to the form.
Forms Orientation	FP_ORT	E	001	Code to identify landscape (L) or portrait (P) mode.
Length of Form	FP_LEN	E	008	Length of the form.
Width of the Form	FP_WID	E	008	Width of the form.

Key Data:

Primary Key (CLF Customer ID, Form ID, Form Sub ID)

Foreign Key FK_FPA (CLF Customer ID)

References Customer Profile

On Delete Cascade;

Foreign Key FK_FPB (CLF Customer ID, Category ID)

References Category Profile

On Delete Set Null;

Indexes:

Name	On Columns	Type of Index
FPIDX	CLF Customer ID	Primary, Ascending, Unique

		Form ID
		Form Sub ID
	FPIDXA	CLF Customer ID Ascending
		Category ID

Relationship to Other Tables:

Parent of:	Distribution Profile thru CLF Customer ID, Form ID
	Form Output Format thru CLF Customer ID, Form ID, Form Sub ID
	Form Field Information thru CLF Customer ID, Form ID, Sub ID
Dependent of:	Customer Profile thru CLF Customer ID
	Category Profile thru CLF Customer ID, Category ID

The category table file 163 is utilized to indicate the form category to which a particular form has been assigned. A typical configuration of the category table 163 is as follows:

TABLE NAME: CATEGORY TABLE ALIAS: CT

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID	CT_CLF_CUS_ID	1	006	Uniquely identifies each customer.
Category ID	CT_CTG_ID	2	010	Code of form category to which a form is assigned.
Category Description	CT_CTG_DSC	8	030	Description of form category.

Key Data:

Primary Key (CLF Customer ID, Category ID)

Foreign Key (FK_CTA (CLF Customer ID)
References Customer Profile
on Delete Restrict;

Indexes:

Name	On Columns	Type of Index
CTIDX	CLF Customer ID	Primary, Ascending, Unique
	Category ID	

Relationship to Other Tables:

Parent of:	Form Profile thru Category ID
Dependent of:	Customer Profile thru CLF Customer ID

Also interrelated with the form profile data file 162 are the usage statistics file 164, the form field information file 165, and the form output format file 166. A typical configuration of the usage statistics file 164 is as follows:

TABLE NAME: USAGE STATISTICS ALIAS: STAT

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID		E	006	Uniquely identifies each customer.
Form ID		E	008	Code to uniquely identify a form for a customer.
Form Sub ID		E	002	Code to uniquely identify each revision of the form.
User ID		E	006	The logon ID associated with each CLF user.
Printer Type		E	002	Code of printer type (HP-PCL, Postscript, etc.).
Site ID		E	006	Identifier to uniquely identify a site for a custome
Date Used		E	002	Date the form was used
Time Used		E	002	Time the form was used
Number of Copies		E	002	The number of copies printed at user site.

A typical configuration of the form field information file 165 used for form fill capabilities is as follows:

NAME: FORM FIELD INFORMATION ALIAS: FF

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID		1	006	Uniquely identifies each customer.
Form ID		2	008	Code to uniquely identify a form for a customer.
Form SUB ID		3	003	Code to uniquely identify each revision of the form
Field Number		4	003	Sequential number of fields within a form.
Field Name		E	020	Name of the field
Data Description		E	040	Concise description of data used in this field
Field Length		E	002	Describes the length of the field
Field Format		E	005	Describes the field format.
Field Type		E	001	Defines the field type. I.E. Numeric
Field Location		E	040	The location of the data in the users file

Key Data:

Primary Key (CLF Customer ID, Form ID, Form Sub ID, Field Number)

Foreign Key FK_FF (CLF Customer ID, Form ID, Form Sub ID)

References Form Profile

on Delete Cascade;

Indexes:

Name	On Columns	Type of Index
FFIDX	CLF Customer ID	Primary, Ascending, Unique
	Form ID	
	Form Sub ID	
	Field Number	

Relationship to Other Tables:

Dependent of: Form Profile thru CLF Customer ID, Form ID, Form Sub ID

A typical configuration of the form output format file 166 provides how the form is to be printed -- the various print formats available. It is as follows (note that the output format of each form may be "source", "print ready" (and various versions), or "compiled"):

NAME: FORM OUTPUT FORMAT ALIAS: FO

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID	FO_CLF_CUS_ID	1	006	Uniquely identifies each customer.
Form ID	FO_FORM_ID	2	008	Code to uniquely identify a form for a customer.
Form Sub ID	FO_FRM_SUB_ID	3	002	Code to uniquely identify each revision of the forr
Output Format Type	FO_FRMT_TYP	4	001	Code that describes from type S-Source C-Compile P-Print Ready
Printer Type	FO_PTR_TYP	5	002	Code of printer type (HP-PCL, Postscript, etc.).
Form Format File ID	FO_FILE_NAME	B	012	File ID where form format data is stored. DOS 8.3 Format.
Compression Indicator	FO_COMPRESS_IND	B	001	Code to tell if the form is compressed. Y-Yes N-Nc

Key Data:

Primary Key (CLF Customer ID, Form ID, Form Sub IS, Output Format Type, Printer Type)

Foreign Key FK_FOA (CLF Customer ID, Form ID, Form Sub ID)

References Form Profile

On Delete Cascade;

Indexes:

Name	On Columns	Type of Index
FOIDX	CLF Customer ID	Primary, Ascending, Unique
	Form ID	
	Form Sub ID	
	Output Format Type	
	Printer Type	

Relationship to Other Tables:

Dependent of: Form Profile thru CLF Customer ID, Form ID, Form Sub ID

The security interface for all of the files is provided through menu file 167. A typical configuration of the file 167 is as follows:

NAME: MENU ALIAS: MENU

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
Security Level		1	000	Defines the level of authority for each user.
Program ID				
Program Name				
Program Desc				
Screen Loc				
Trans ID				

Key Data:

Primary Key (CLF Customer ID, ????)

Foreign Key CATA (CLF Customer ID)
References Customer Profile
On Delete Cascade;

Where desired, as a dependent of the group profile file 157, a group/form file may be provided associates forms to a group. The group/form file is illustrated at 169 in FIGURE 12. A typical configuration of the group/form file, if utilized, is as follows:

NAME: GROUP/FORM ALIAS: GF

ELEMENT/RECORD	DB TABLE ELE.	KEY	LEN	DEFINITION
CLF Customer ID		1	006	Uniquely identifies each customer.
Group ID		2	006	Code to uniquely identify the distribution group.
Group Sequence Number		3	003	Sequence number to control level within a group
Form ID		4	008	Code to uniquely identify a form for a customer.

Key Data:

Primary Key (CLF Customer ID, Group ID, Group Sequence Number, Form ID)

Foreign Key FK_GFA (CLF Customer ID, Group ID, Group Sequence Number)
References Group Profile
On Delete Cascade;

Indexes:

Name	On Columns	Type of Index
GFIDX	CLF Customer ID	Primary, Ascending, Unique
	Group ID	
	Group Sequence Number	
	Form ID	
GFIDXA	CLF Customer ID	Ascending
	Group ID	
	Group Sequence Number	
GFIDXB	CLF Customer ID	Ascending
	Form ID	

Relationship to Other Tables:

Dependent of: Group Profile thru CLF Customer ID, Group ID, Group Sequence Number

After selection of the appropriate form and other information, the form is printed and(or displayed, as indicated schematically at 168 in FIGURE 11.

FIGURE 12 contains the same basic information as FIGURE 11, but shows the data base relationships for referential integrity purposes, and is self-explanatory.

FIGURES 13a through 13i provide a detailed structure chart which shows the program-defined menu structure for the CLF 12. The interrelationship between the individual figures are specifically illustrated thereon, and the relationships between the various elements are self-explanatory from FIGURES 13a through 13i. Elements 190 are elaborated upon in FIGURE 14.

FIGURE 14 illustrates the general flow for the release of forms from the CLF 12 to the end user sites 15 (190 in FIGURE 13a). At 201, the CLF software periodically (e.g every weekday) polls the distribution profile for forms in the computer hosting the CLF to release electronic forms based upon release date (that is, if the release date has now been reached). At 202, the forms available for release are gathered. At 203, the communications software is alerted, and the forms are passed in as an input. At 204, the forms are transferred using the telecommunications infrastructure in place to the sites 15 (e.g. the PCs 154 thereat), as defined by the distribution profile. At 205, the receiving site communication software (e.g. OS/2, version 1.2) receives the forms. At 206, upon receipt of the forms, the applications software is alerted for processing of the transmission. The forms are preferably initially stored on disk. Ultimately, at 207, the applications software may direct the electronic forms to be printed at a printer (e.g. 16), to produce a paper form.

FIGURE 15 indicates the general flow for sending a form to one of the geographically remote user locations from the CLF 12. At 210 the program is initiated from the CLF 12 applications file 29. A session with the desired remote station or stations (locations) is allocated at 211, and all requested files are sent at 212. Confirmation that the files have been sent is provided at 213. Any data to be received from the remote location is received at 214, and receipt acknowledged at 215, before the program ends.

FIGURE 16 illustrates the general flow chart for sending a print request from CLF 12 to a remote user location having a printer, e.g. 16, for actually printing the form that was sent according to 210-213. The program is started from the CLF 12 applications software 29 at 217, a session is allocated with the remote location at 218, the print request is sent at 219 to the corresponding software at the remote location, and is confirmed at 220 before the program ends.

It will thus be seen that according to the present invention a system and method have been provided for eliminating or minimizing warehousing, inventory, and obsolescence costs that a customer typically incurs in association with preprinted paper forms. Forms distribution costs are minimized, and the number of preprinted forms can be greatly minimized (for example the number of forms can be dropped from 20,000 to 5,000 in conventional operations). Centralized control is provided for electronic forms design, and the co-existence of a form in electronic and paper media is provided. Labor savings are achieved by eliminating redundant entry and processing of information by providing a centralized system, and where a customer desires, off load processing may be provided from the customer's main frame computer 34 to the vendor's computer (e.g. location of the FAP 14). Based upon geographic location, volume requirements, form construction (e.g. number of parts, MCP, etc.), and equipment profiles, exactly how paper forms will be constructed and delivered to end user sites 15 will be determined.

The system as described above has numerous special applications, and it is impossible within the scope of a patent application to designate all possible uses of the system for particular functions and businesses. However a rough and general description of one particular implementation may serve to illustrate the versatility and functionality of the invention.

A FAP 14 is provided at the vendor's facility, and is used to design electronic and preprinted forms, to control variable data fields for the electronic forms, and to control and directly communicate with the CLF 12 located on the customer's premises. Upon release of new forms or update of existing forms, the CLF populates the forms library containing appropriate form images and updates the appropriate tables with and control information. This file is sent to a software distribution resource in a main frame computer at a centralized location, which is central to a number of geographically remote user locations which it will service. Preferably, a main frame computer utilizes the customer environment; although the forms could be stored in the customer's main frame, if desired. At the scheduled release dates, either automatically, or by operator control or verification at the centralized location, the CLF will effect distribution of the electronic forms to a file server residing in each of the geographically remote user locations.

The forms automation system 10 in this particular example is used to automate the ultimate customer interview process that occurs when new accounts are established at a banking institution, or changes are made to existing accounts. The exact detail of the processing performed during the customer (bank's) interview will determine the forms which are to be printed. For example opening of checking accounts, time deposit accounts, and savings accounts will generate different forms that are ultimately printed. In addition to printing the electronic forms, the forms automation system 10 according to the invention will produce a check list of all forms printed as a result of specific activity on an account, and all forms required to document an interview will be printed immediately at the completion of the interview process so that the bank's customer will have – before he or she leaves the bank – a paper form. Three to five bank customer interviews can take place concurrently and the common data for each will automatically be transferred from one electronic form to the other.

ARGO Bankpro software is downstream of the CLF 12, as an end user interface. The customer data is transferred to the main frame through platform automation support software (PASS), a commercially available system, and at the main frame the data is stored in a CIS software package, provided by Hogan.

The file server in each bank remote user site is networked to other devices in that location, for example by an IBM Lan 1.2. A laser printer will be located in each remote site, such as an HP LASERJET, to provide actual printing at the user location. Different printers can be provided at different locations since the forms creation software at the FAP 14 will format each individual electronic form in whatever formats are necessary to properly print with the various printers at the user locations at which the printers are located JF MERGE software, from the same manufacturer as the JETFORM forms design package, will reside on the file server, and will be provided to produce the forms, which will be printed as soon as the transaction is completed.

During processing, the customer will store the variable data to be added to the form at a generic data base. At the completion of the transaction/end bank customer interview, the forms automation software will be invoked. Variable data will be extracted from the generic data base and an Ascii file created, which will be used

to input to the form merge software (e.g. JF MERGE). The forms required to verify the transaction will be printed, and a check list form to make sure that all necessary steps have been completed will also be printed.

While the implementation described above is practiced with only a few (e.g. five) different forms, it may be expanded to encompass literally thousands of different forms.

While the invention has been described in connection with what is presently considered to be the most practical and preferred embodiment, it is to be understood that the invention is not to be limited to the disclosed embodiment, but on the contrary, is intended to cover various modifications and equivalent arrangements and methods included within the spirit and scope of the appended claims.

Claims

1 A system for production of business forms, comprising:

first computer means comprising a forms automation platform means; for establishing each of a plurality of business forms in electronic format; for determining print format information for said forms; and for converting said electronic format to appropriate print formats based upon said distribution profile information and print format information, to design a business form in electronic format;

second computer means at each of a plurality of end user sites, including means for inputting variable information, if any, to be contained in the business forms to be produced;

third computer means comprising a central library means: for processing requests for distribution to effect electronic distribution of forms; and for providing information about print formats and distribution profiles to said second computer means, said means including a display and an inputting means for inputting commands regarding the specific business form or forms requested; and communication means for providing communication between said forms automation platform means and said central library means, and between said central library means and said end user sites.

2 A system according to claim 1 comprising printing means controlled by one or more of said computer means for printing out paper business forms.

3 A system for automating business forms creation, management, and production, comprising:

printing means;

first computer means, including a business forms automation platform means, comprising: means for designing customer business forms; means for managing display images for existing business forms in electronic format; and means for converting display images into appropriate print formats;

second computer means including a central library means comprising an electronic data base of print images for a plurality of different business forms, and of distribution location information for each of said forms; and means for managing said print images;

means associated with said computer means for controlling said printing means so that said printing means will print business forms in response to print images from said second computer means; and

means for providing two way communication between said first and second computer means; said system optionally further comprising third computer means at end user locations remote from said first and second computer means, and means for providing two way communication between said second and third computer means for transmission of data -- including electronic business forms -- and instructions.

4 A method of electronically developing, producing, managing and distributing a plurality of different business forms for an entity having a plurality of geographically remote use locations with different needs for different business forms, comprising the steps of:

(a) at a centralized location, storing the plurality of business forms in electronic format including print images;

(b) based on geographic location, volume requirements, form construction, and equipment profile, determining which of the geographically remote use locations will be provided with business forms, and storing that information at said centralized location; and

(c) through electronic scheduling or in response to commands input at said centralized location, automatically distributing forms from the centralized location to the geographically remote use locations for that particular form, according to the determinations provided in step (b); said method optionally comprising the further step (d) of providing for electronic storage of the forms at decentralized locations, and subsequent processing; said subsequent processing for example comprising selecting either data entry and production using electronic imaging or traditional production, as determined in step (b).

5 A method of handling business forms, comprising the steps of:

(a) creating a plurality of business forms in electronic format using a plurality of different business form creating computer programs;

(b) maintaining the business forms created in step (a) in a display image format to which variables may be added for variable image data;

(c) converting the display of form image format for each of a plurality of forms to desired printer formats (eg by utilizing the business form creating computer programs themselves);

(d) simultaneously transmitting the printer formats to each of a plurality of compatible printers; and

(e) printing out the forms on the compatible printers.

6 A method providing a user of a plurality of different business forms at a plurality of geographically remote locations with the business forms in an efficient manner, and without the necessity of warehousing preprinted paper forms, comprising the steps of:

(a) storing the business forms in electronic format at a centralized location;

(b) producing the business forms in paper form at geographic locations proximate each of the geographically remote use locations in response to an electronic order generated by a centralized or remote command; and

(c) delivering the business forms in paper form to each of the geographically remote use locations after production thereof; said steps (b) and (c) optionally being practised simultaneously at at least one of the geographically remote use locations.

7 A method of distributing business forms to each of a plurality of geographically remote end users, comprising the steps of:

(a) storing in electronic format in a computer a plurality of different business forms;

(b) also storing in the computer predefined commands, including date and extent of distribution commands, relating to the distribution of the electronic business forms;

(c) periodically polling (for example once every weekday) the computer to locate applicable date commands; and

(d) in response to applicable date commands located in step (c), automatically distributing the electronic business forms to those of the plurality of end users specified by the distribution commands.

8 A method of distributing electronic images to each of a plurality of geographically remote end users, comprising the steps of:

(a) storing a plurality of different electronic images;

(b) also storing in the computer predefined commands, including date and extent of distribution commands, relating to the distribution of the electronic images;

(c) periodically polling (for example once every weekday) the computer to locate applicable date commands; and

(d) in response to applicable date commands located in step (c), automatically distributing the electronic images to those of the plurality of end users specified by the distribution commands.

9 A method of distributing business forms to each of a plurality of geographically remote end users, comprising the steps of:

(a) storing in electronic format in a computer a plurality of different business forms;

(b) also storing in the computer predefined commands, including date and extent of distribution commands, relating to the distribution of the electronic business forms;

(c) periodically polling the computer to locate applicable date commands;

(d) in response to applicable date commands located in step (c), readying the electronic business forms for distribution to those of the plurality of end users specified by the distribution commands; and

(e) manually verifying the distribution of the electronic business forms to those of the plurality of end users specified by the distribution commands, and after manual verification, automatically distributing the electronic business forms to those of the plurality of end users specified by the distribution commands; said steps (d) and (e) for example being practised at a location remote from said geographically remote end users.

10 A method of distributing electronic images to each of a plurality of geographically remote end users, comprising the steps of:

(a) storing a plurality of different electronic images in a computer;

(b) also storing in the computer predefined commands, including date and extent of distribution commands, relating to the distribution of the electronic images;

(c) periodically polling the computer to locate applicable date commands;

(d) in response to applicable date commands located in step (c), readying the electronic images for distribution to those of the plurality of end users specified by the distribution commands; and

(e) manually verifying the distribution of the electronic images to those of the plurality of end users specified by the distribution commands, and after manual verification, automatically distributing the electronic images to those of the plurality of end users specified by the distribution commands; said steps (d) and (e) for

example being practised at a location remote from said geographically remote end users.

11 A system for production of business forms comprising:

a first location having a first printer with a first printer format;

a second location with a second printer having a second printer format, said second location being geographically remote from said first location;

a first computer means for storing electronic business forms in both the first and second printer formats, said first computer means being located geographically remote from said first and second printers; and

communication means for interconnecting said first computer means and said first and second printers so that said first computer means transmits commands to said first and second printers to print the same paper form on both; said system optionally further comprising a second computer means comprising means for creating electronic business forms, and second communication means for transmitting created electronic business forms from said second computer means to said first computer means.

12 A method of handling business forms, comprising the steps of:

(a) creating a plurality of business forms in electronic format;

(b) maintaining the business forms created in step (a) in a display image format to which variables may be added for variable image data;

(c) electronically transmitting the display image formats; and

(d) ultimately converting the display of form image formats to desired printer formats, said method optionally comprising the further steps of:

(e) simultaneously transmitting the printer formats to each of a plurality of compatible printers; and

(f) printing out the forms on the compatible printers.

13 A method of electronically developing, producing, managing and distributing a plurality of different business forms for an entity having a plurality of geographically remote use locations with different needs for different business forms, comprising the steps of:

(a) at a centralized location, storing the plurality of business forms in electronic format including by providing each with the following data associated therewith: identification code for the form; verbal description of the form; software package used to design the form; date of form creation and/or last revision; number of parts to the form; whether the form has landscape or portrait mode; length of the form; and width of the form;

(b) based upon geographic location, volume requirements, form construction, and equipment profile, determining which of the geographically remote use locations will be provided with business forms in electronic and/or preprinted form, and storing that information at said centralized location; and

(c) through electronic scheduling or in response to commands inputted at said centralized location automatically distributing forms in electronic and/or preprinted form from the centralized location to the geographically remote use locations for that particular form, according to the determinations provided in step (b).

14 A method of electronically creating and managing a plurality of different business forms, utilizing a first computer at a first location, and a second computer at a second location, comprising the steps of:

(a) at the first computer, creating a plurality of business form in electronic format, including printer formats;

(b) allocating a session with the second computer;

(c) designating appropriate business forms for transfer;

(d) electronically transferring the designated forms from the first computer to the second computer;

(e) confirming that the transfer has taken place; and

(f) initiating a table population function at the second computer, and confirming when that function has been completed.

15 A system according to any one of the preceding claims wherein said third computer means comprising a file comprising customer profile information including an identification uniquely identifying each customer, and address information for the customer; a geographic profile including the customer identification and a unique code for each different geographic location of the customer's facilities; a printer profile file including the customer identification, and a code identifying each printer, and the type of printer, at each geographic location of the customer; a distribution data file including the customer identification, a code to uniquely identify each form for a customer, and the code to uniquely identify each printer; a form profile data file including the customer identification, and the code to identify each form for a customer; and a form output file including the customer identification, and a code to uniquely identify the format of each form of the customer.

16 A system according to claim 1, said first computer means having: a customer profile file including an identifier uniquely identifying a customer and a customer's address; a form profile file including the unique customer identifier, a unique identifier of a form for a customer, and physical information about the form; a form file name file including the unique customer identifier and unique identifier for the form, and the type of printer the form is designed for; and a distribution information file including the unique customer identifier, an indicator

of whether or not a form has been selected for distribution to said third computer means, the unique form identifier, and the date of distribution of the form.

17 A method of distributing business forms to each of a plurality of geographically remote end users, comprising the steps of:

(a) storing in electronic format in a computer a plurality of different business forms;

(b) also storing in the computer predefined commands, including date and extent of distribution commands, relating to the distribution of the electronic business forms;

(c) periodically polling the computer to locate applicable data commands;

(d) identifying forms for distribution in the computer;

(e) establishing a session between the computer and an end user;

(f) transferring the forms electronically from the computer to the end user; and

(g) acknowledging receipt of the forms by the end user from the computer.

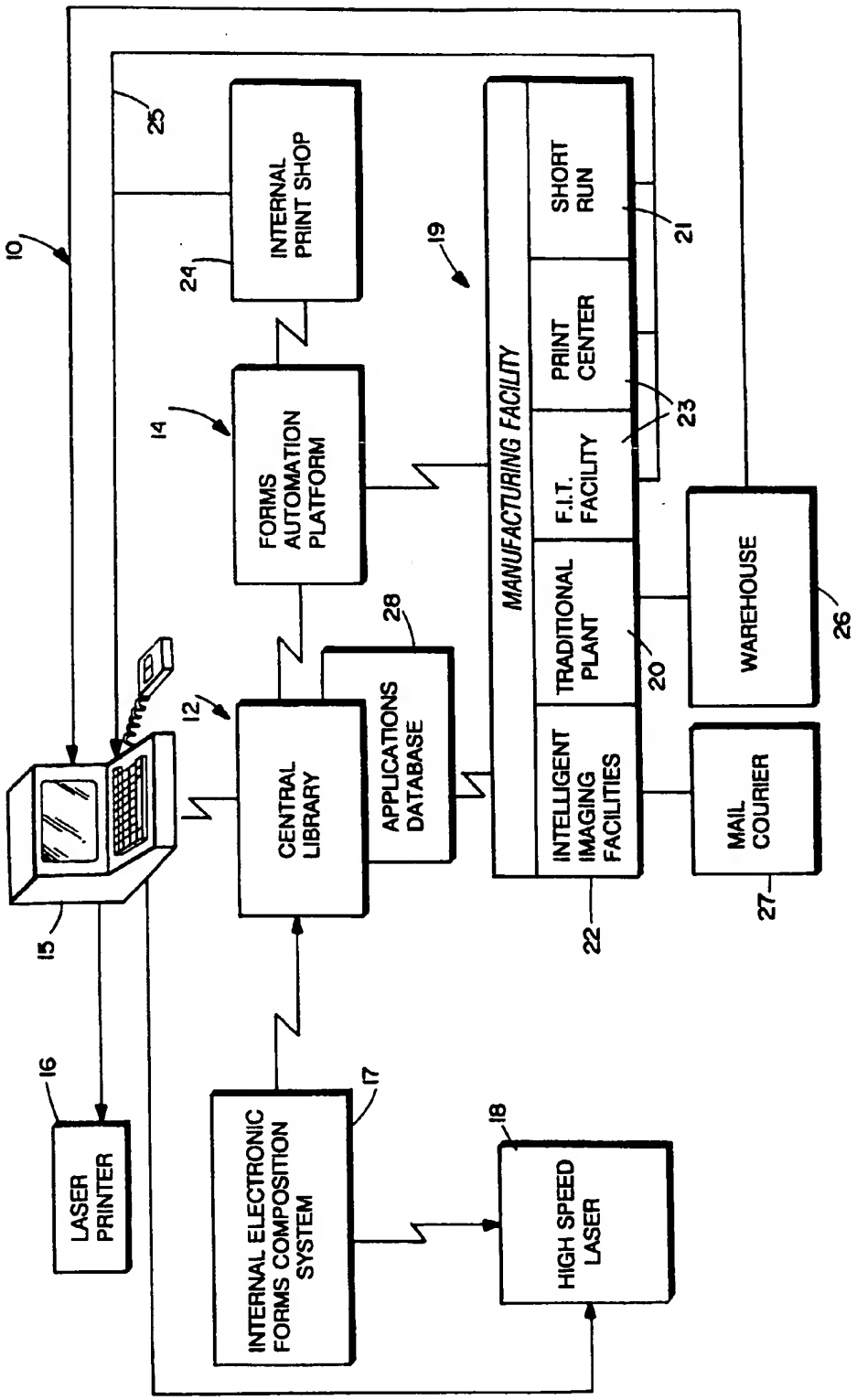
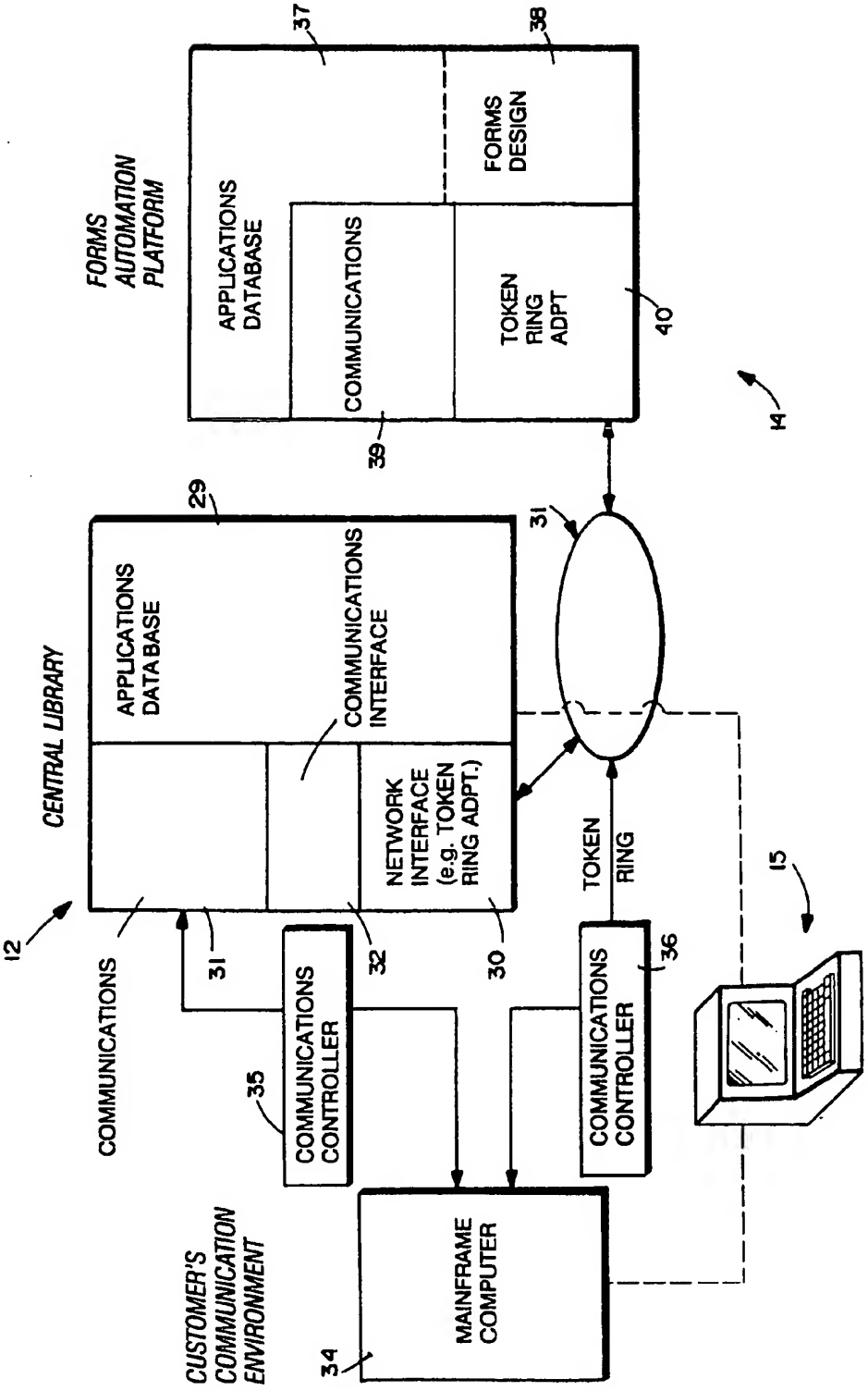


Fig. 1 ONE OF MULTIPLE END USERS

Fig. 2


FORMS AUTOMATION PLATFORM
APPLICATIONS DATABASE
COMMUNICATIONS
TOKEN RING ADPT
FORMS DESIGN
37
38
39
40
14
CENTRAL LIBRARY
APPLICATIONS DATA BASE
COMMUNICATIONS INTERFACE
NETWORK INTERFACE (e.g. TOKEN RING ADPT.)
29
31
32
30
12
COMMUNICATIONS
TOKEN RING
15
COMMUNICATIONS CONTROLLER
35
COMMUNICATIONS CONTROLLER
36
CUSTOMER'S COMMUNICATION ENVIRONMENT
MAINFRAME COMPUTER
34

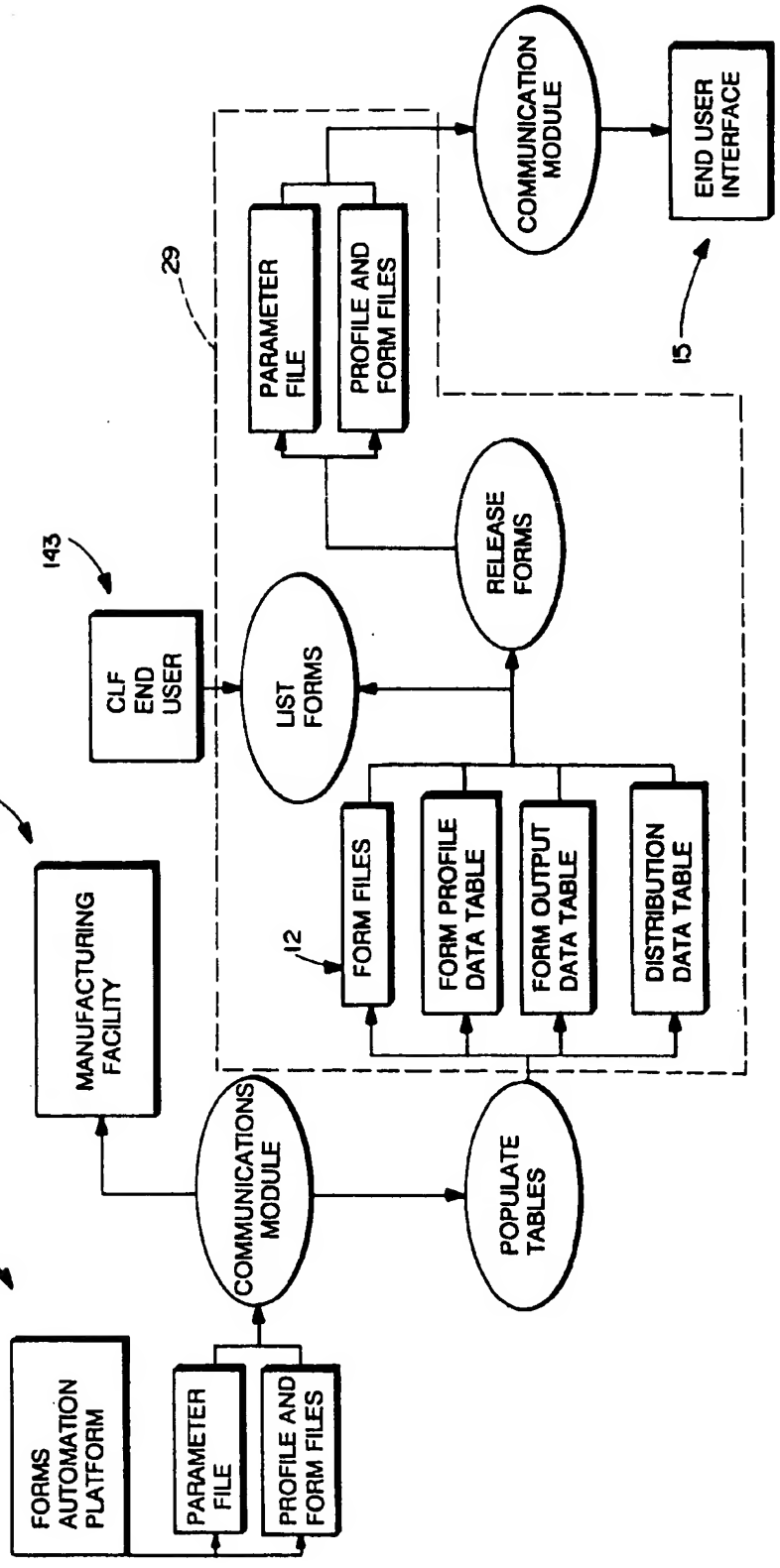
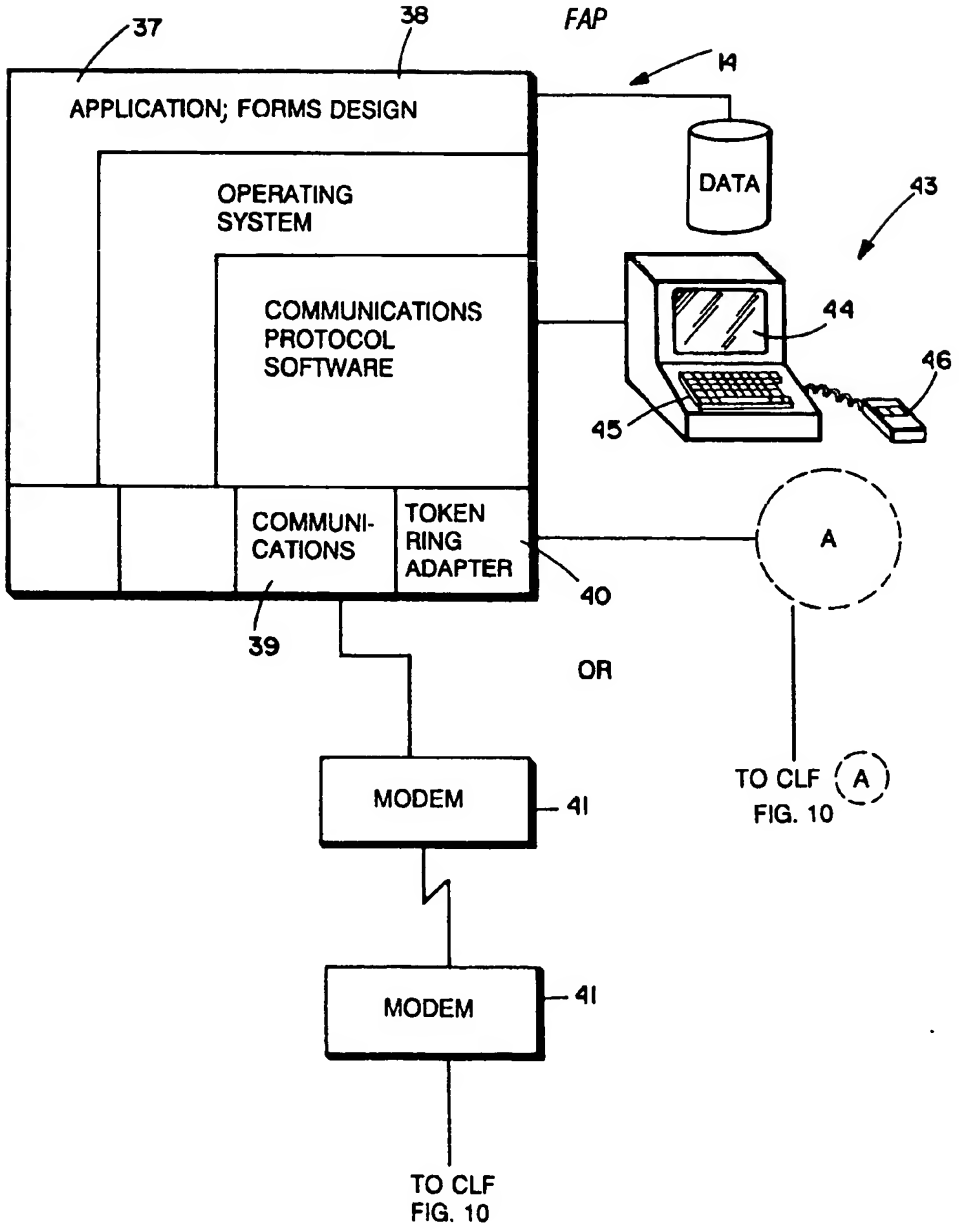

FORMS AUTOMATION PLATFORM
PARAMETER FILE
PROFILE AND FORM FILES
14
COMMUNICATIONS MODULE
MANUFACTURING FACILITY
19
POPULATE TABLES
29
FORM FILES
FORM PROFILE DATA TABLE
FORM OUTPUT DATA TABLE
DISTRIBUTION DATA TABLE
12
LIST FORMS
RELEASE FORMS
CLF END USER
143
PARAMETER FILE
PROFILE AND FORM FILES
COMMUNICATION MODULE
END USER INTERFACE
15

Fig. 3

Fig. 4


37
38
FAP
14
APPLICATION; FORMS DESIGN
OPERATING SYSTEM
COMMUNICATIONS PROTOCOL SOFTWARE
DATA
43
44
46
45
COMMUNI-CATIONS
TOKEN RING ADAPTER
40
A
39
OR
MODEM
41
TO CLF FIG. 10
A
MODEM
41
TO CLF FIG. 10

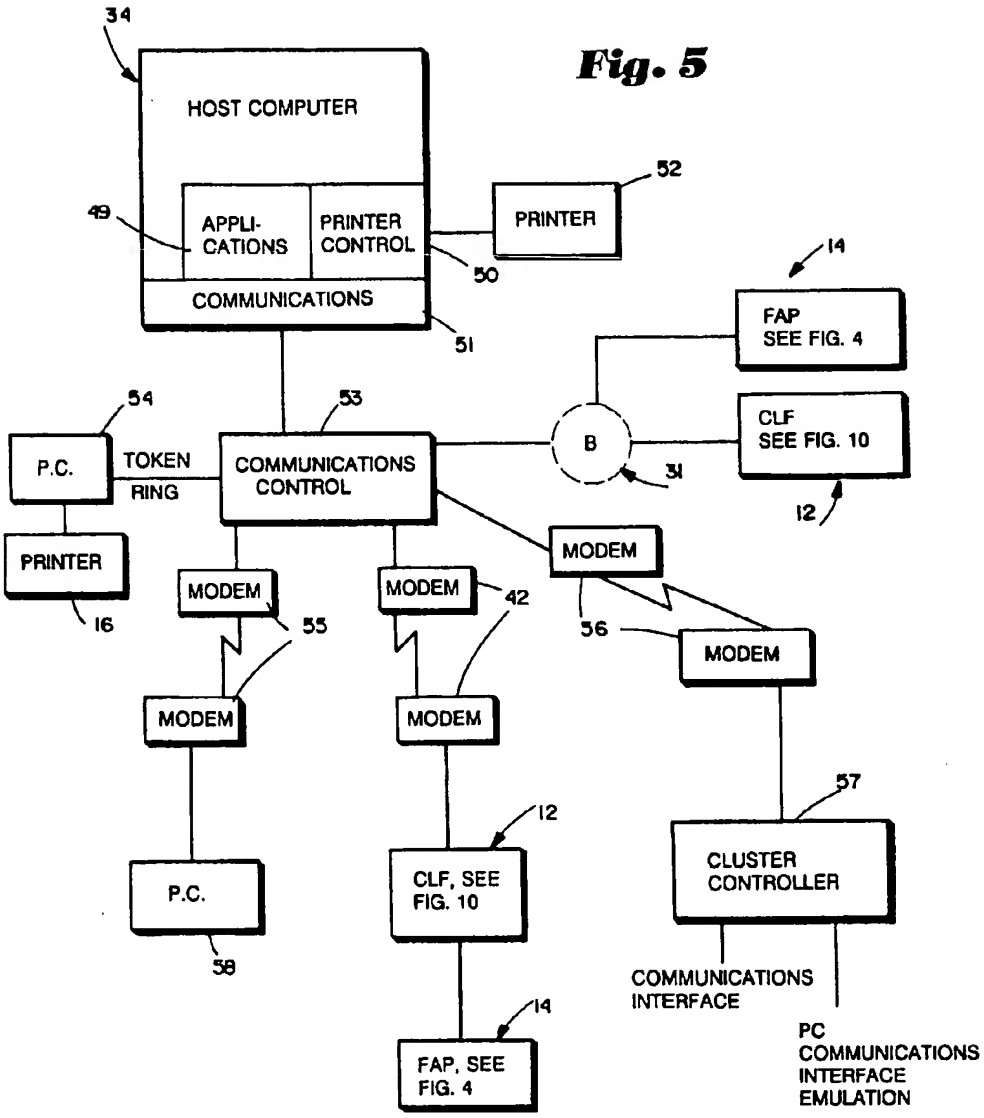

34
HOST COMPUTER
49
APPLI-CATIONS
PRINTER CONTROL
50
COMMUNICATIONS
51
PRINTER
52
14
FAP SEE FIG. 4
CLF SEE FIG. 10
12
B
31
54
P.C.
TOKEN RING
53
COMMUNICATIONS CONTROL
PRINTER
16
MODEM
55
MODEM
42
MODEM
56
MODEM
MODEM
MODEM
57
CLUSTER CONTROLLER
12
P.C.
58
CLF, SEE FIG. 10
14
FAP, SEE FIG. 4
COMMUNICATIONS INTERFACE
PC COMMUNICATIONS INTERFACE EMULATION

Fig. 5

Fig. 6

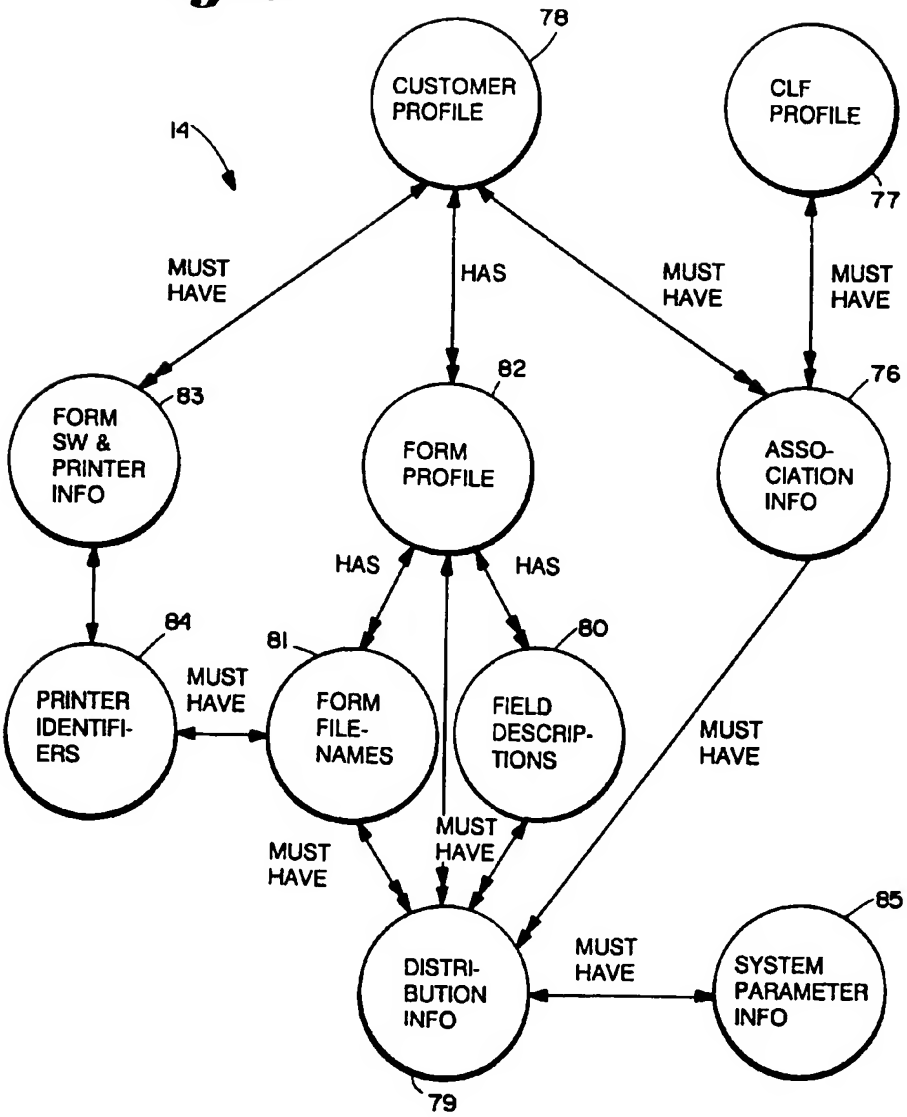

78
CUSTOMER PROFILE
CLF PROFILE
77
14
MUST HAVE
HAS
MUST HAVE
MUST HAVE
82
76
83
FORM SW & PRINTER INFO
FORM PROFILE
ASSO-CIATION INFO
HAS
HAS
84
81
80
PRINTER IDENTIFI-ERS
MUST HAVE
FORM FILE-NAMES
FIELD DESCRIP-TIONS
MUST HAVE
MUST HAVE
MUST HAVE
85
DISTRI-BUTION INFO
MUST HAVE
SYSTEM PARAMETER INFO
79

Fig. 7

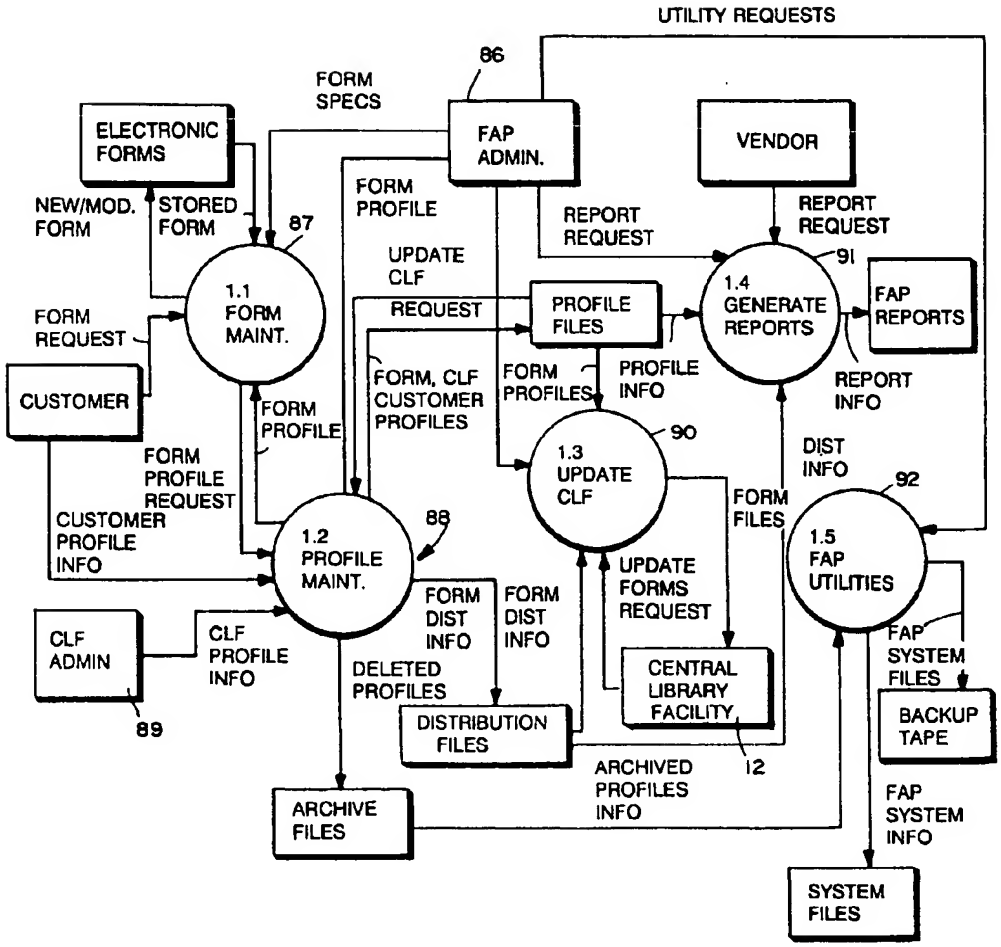

UTILITY REQUESTS
86
FORM SPECS
ELECTRONIC FORMS
FAP ADMIN.
VENDOR
NEW/MOD. FORM
STORED FORM
87
FORM PROFILE
REPORT REQUEST
REPORT REQUEST
91
UPDATE CLF
1.1 FORM MAINT.
PROFILE FILES
1.4 GENERATE REPORTS
FAP REPORTS
FORM REQUEST
REQUEST
CUSTOMER
FORM, CLF CUSTOMER PROFILES
FORM PROFILES
PROFILE INFO
REPORT INFO
FORM PROFILE
90
1.3 UPDATE CLF
DIST INFO
92
FORM PROFILE REQUEST
CUSTOMER PROFILE INFO
88
1.2 PROFILE MAINT.
FORM FILES
1.5 FAP UTILITIES
UPDATE FORMS REQUEST
FORM DIST INFO
FORM DIST INFO
FAP SYSTEM FILES
CLF ADMIN
CLF PROFILE INFO
DELETED PROFILES
CENTRAL LIBRARY FACILITY
BACKUP TAPE
89
DISTRIBUTION FILES
12
ARCHIVED PROFILES INFO
ARCHIVE FILES
FAP SYSTEM INFO
SYSTEM FILES

Fig. 8a

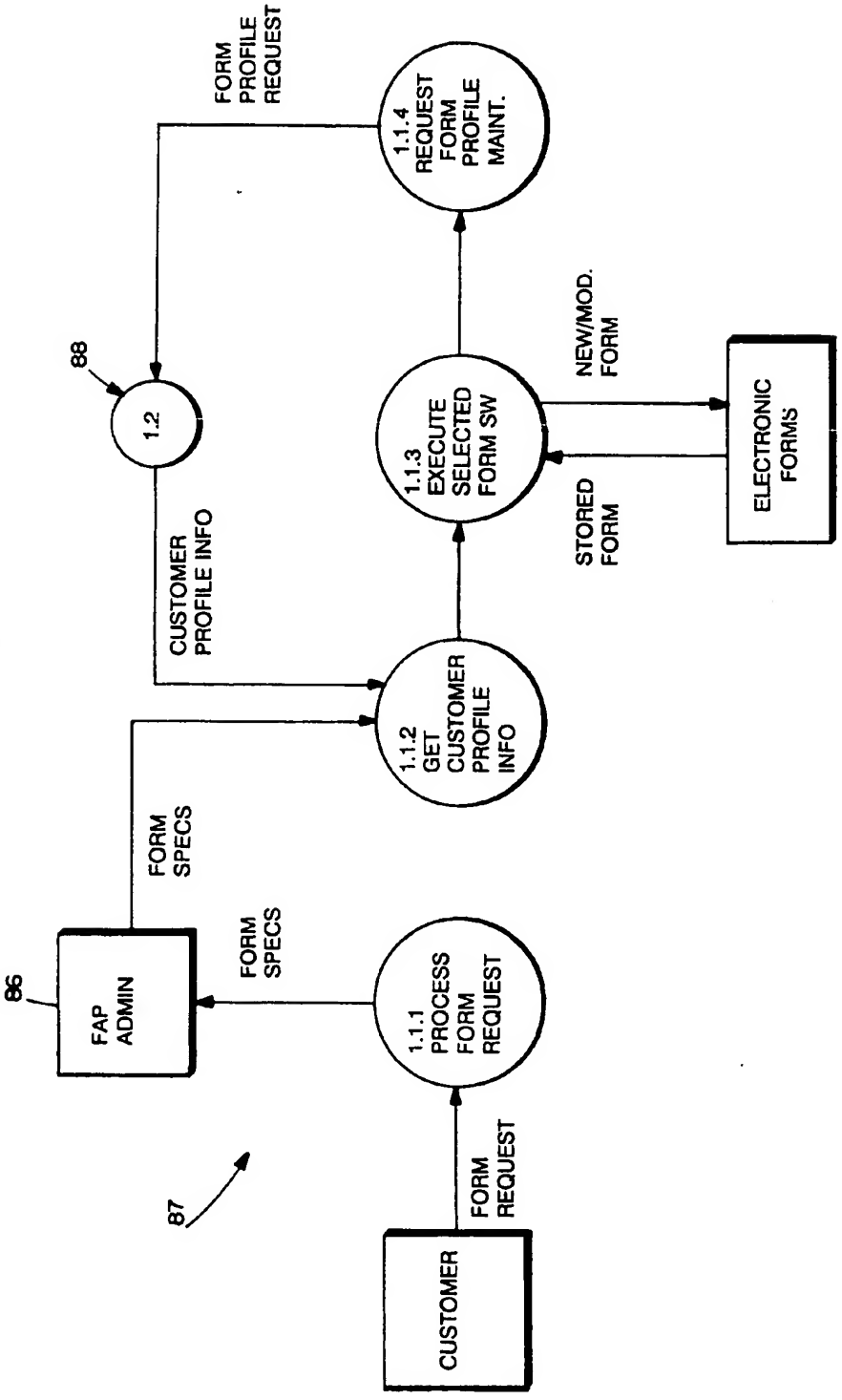
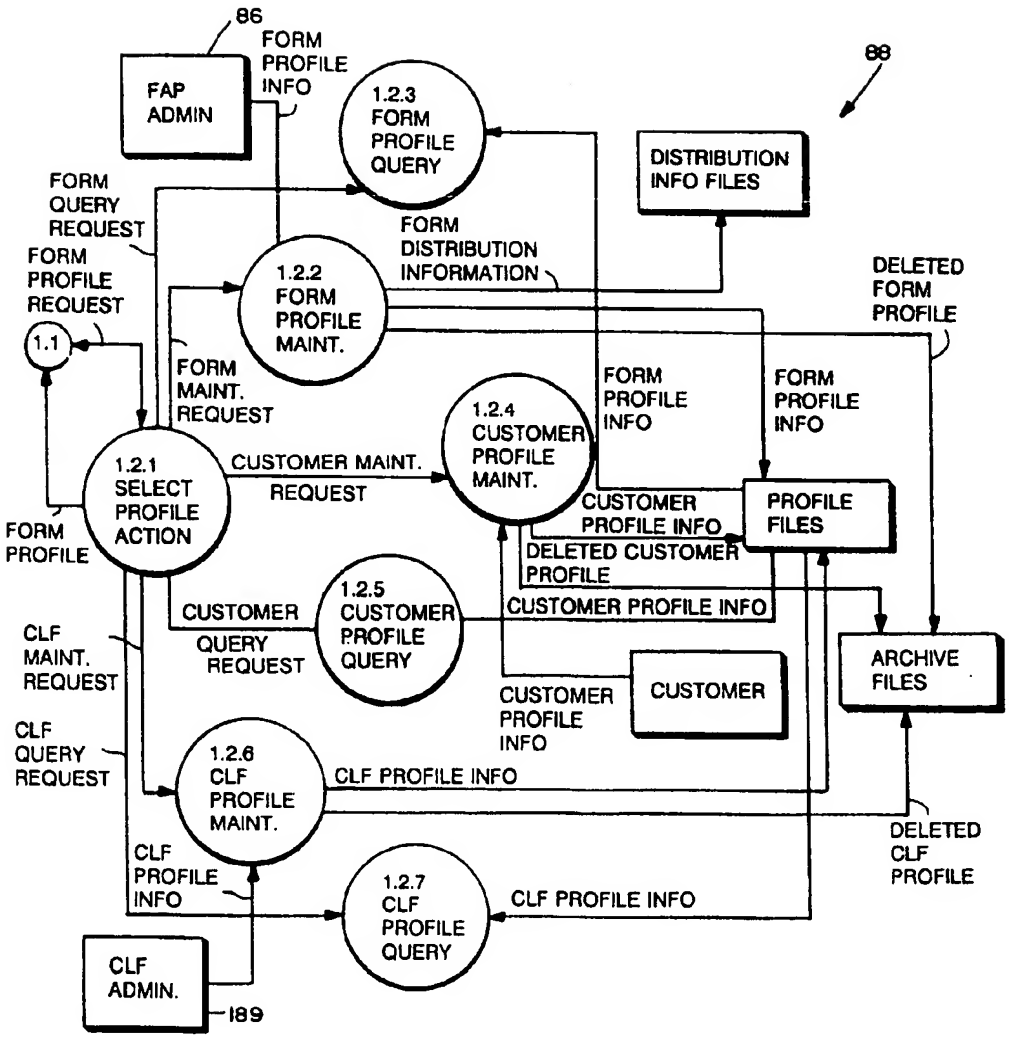

CUSTOMER
FORM REQUEST
1.1.1 PROCESS FORM REQUEST
FORM SPECS
FAP ADMIN
86
87
FORM SPECS
1.1.2 GET CUSTOMER PROFILE INFO
CUSTOMER PROFILE INFO
88
1.2
FORM PROFILE REQUEST
1.1.3 EXECUTE SELECTED FORM SW
1.1.4 REQUEST FORM PROFILE MAINT.
NEW/MOD. FORM
STORED FORM
ELECTRONIC FORMS

Fig. 8b


86
FORM PROFILE INFO
FAP ADMIN
1.2.3 FORM PROFILE QUERY
88
DISTRIBUTION INFO FILES
FORM QUERY REQUEST
FORM PROFILE REQUEST
1.1
1.2.2 FORM PROFILE MAINT.
FORM DISTRIBUTION INFORMATION
DELETED FORM PROFILE
FORM MAINT. REQUEST
FORM PROFILE INFO
FORM PROFILE INFO
1.2.4 CUSTOMER PROFILE MAINT.
1.2.1 SELECT PROFILE ACTION
CUSTOMER MAINT. REQUEST
CUSTOMER PROFILE INFO
PROFILE FILES
FORM PROFILE
DELETED CUSTOMER PROFILE
CUSTOMER PROFILE INFO
1.2.5 CUSTOMER PROFILE QUERY
CUSTOMER QUERY REQUEST
CLF MAINT. REQUEST
CUSTOMER
ARCHIVE FILES
CUSTOMER PROFILE INFO
CLF QUERY REQUEST
1.2.6 CLF PROFILE MAINT.
CLF PROFILE INFO
DELETED CLF PROFILE
CLF PROFILE INFO
1.2.7 CLF PROFILE QUERY
CLF PROFILE INFO
CLF ADMIN.
189

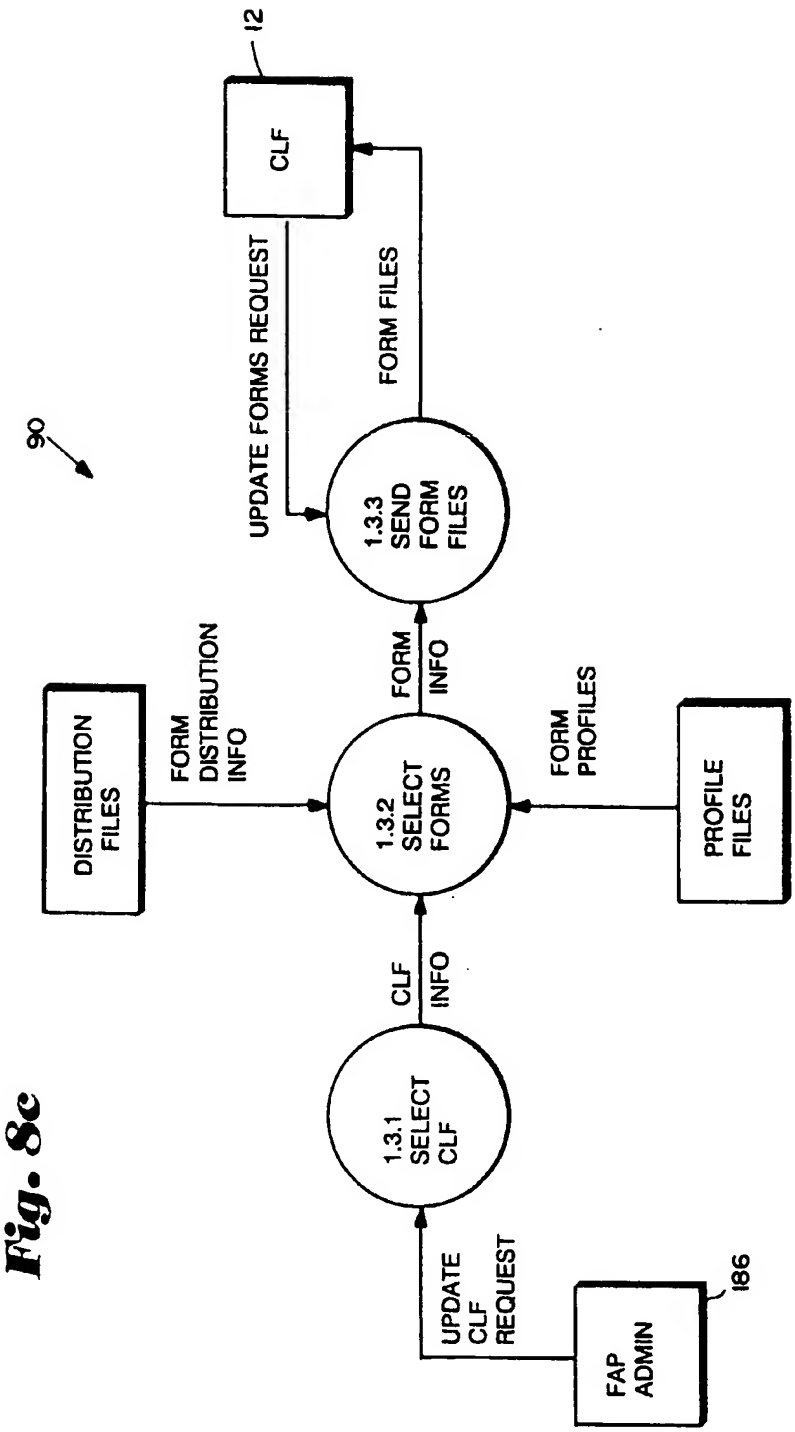

90
12
CLF
UPDATE FORMS REQUEST
FORM FILES
1.3.3
SEND
FORM
FILES
DISTRIBUTION
FILES
FORM
DISTRIBUTION
INFO
1.3.2
SELECT
FORMS
FORM
INFO
FORM
PROFILES
PROFILE
FILES
CLF
INFO
1.3.1
SELECT
CLF
UPDATE
CLF
REQUEST
FAP
ADMIN
186

Fig. 8c

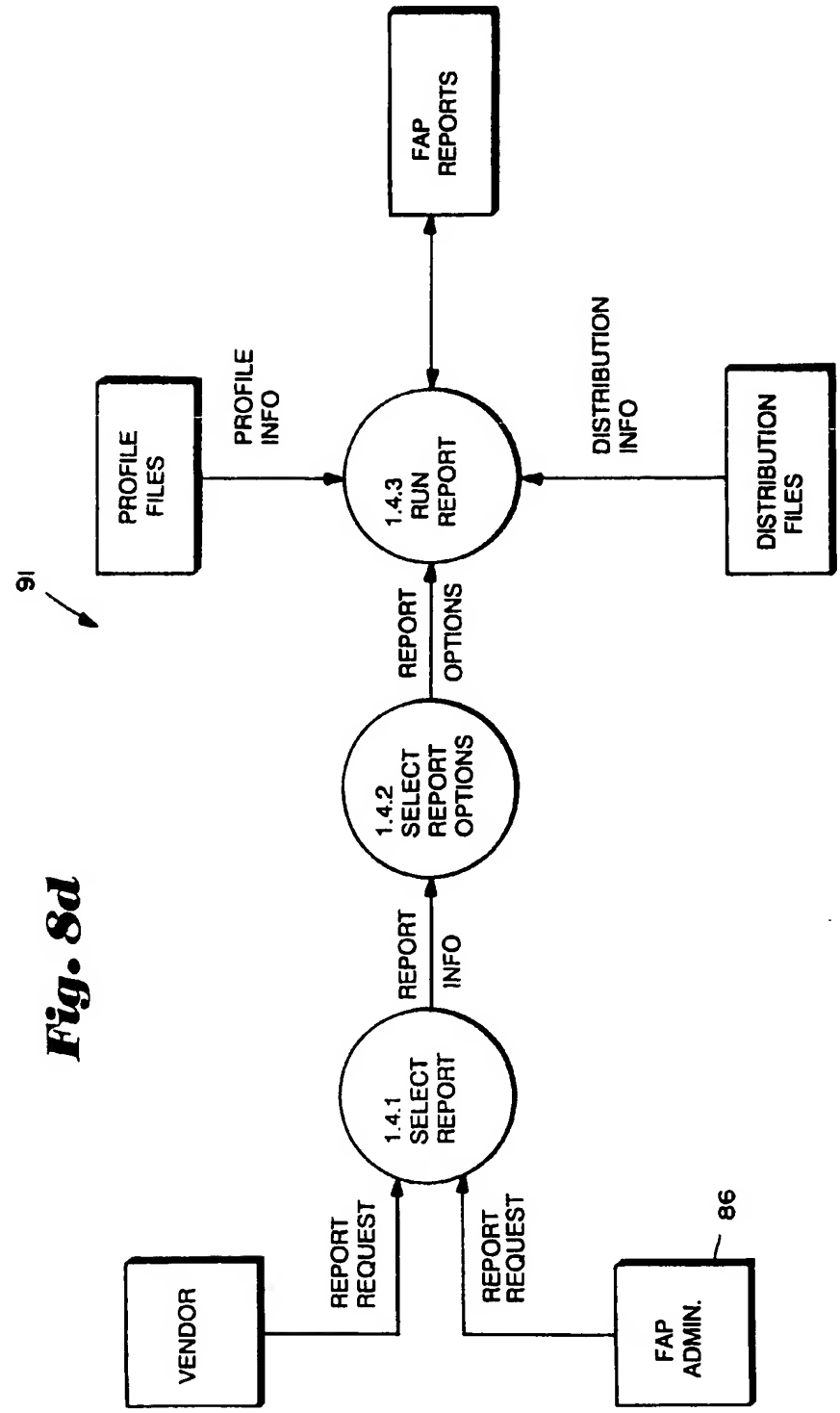

91
VENDOR
REPORT REQUEST
FAP ADMIN.
86
REPORT REQUEST
1.4.1 SELECT REPORT
REPORT INFO
1.4.2 SELECT REPORT OPTIONS
REPORT OPTIONS
PROFILE FILES
PROFILE INFO
1.4.3 RUN REPORT
DISTRIBUTION INFO
DISTRIBUTION FILES
FAP REPORTS

Fig. 8d

Fig. 8e

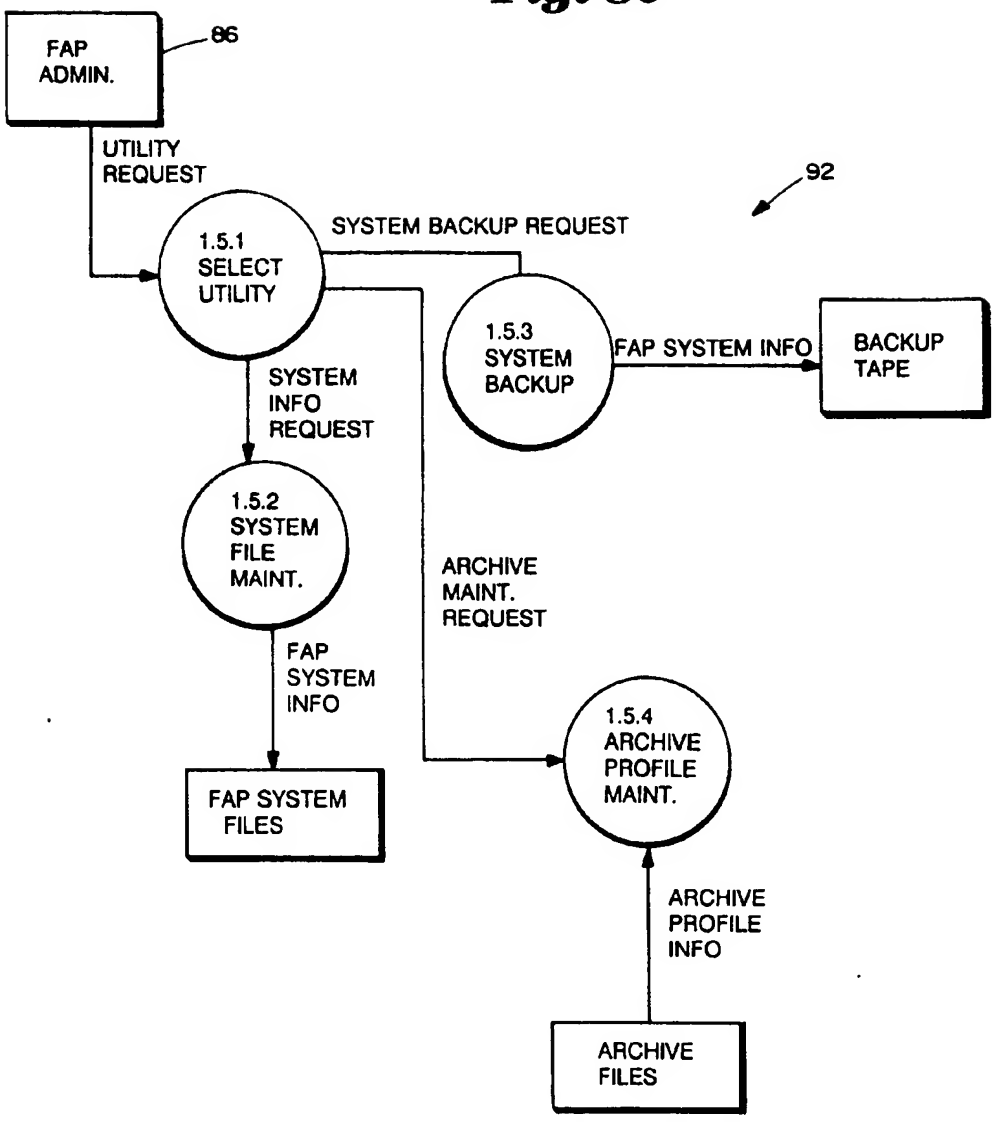

FAP ADMIN.
86
UTILITY REQUEST
92
1.5.1 SELECT UTILITY
SYSTEM BACKUP REQUEST
1.5.3 SYSTEM BACKUP
FAP SYSTEM INFO
BACKUP TAPE
SYSTEM INFO REQUEST
1.5.2 SYSTEM FILE MAINT.
ARCHIVE MAINT. REQUEST
FAP SYSTEM INFO
FAP SYSTEM FILES
1.5.4 ARCHIVE PROFILE MAINT.
ARCHIVE PROFILE INFO
ARCHIVE FILES

Fig. 9 *FAP>CLF*

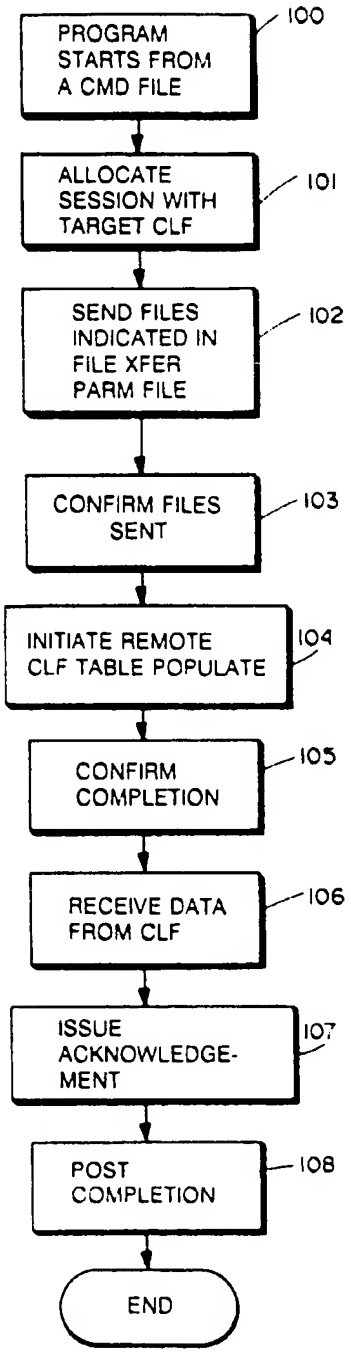

PROGRAM STARTS FROM A CMD FILE
100
ALLOCATE SESSION WITH TARGET CLF
101
SEND FILES INDICATED IN FILE XFER PARM FILE
102
CONFIRM FILES SENT
103
INITIATE REMOTE CLF TABLE POPULATE
104
CONFIRM COMPLETION
105
RECEIVE DATA FROM CLF
106
ISSUE ACKNOWLEDGE-MENT
107
POST COMPLETION
108
END

Fig. 10

CLF

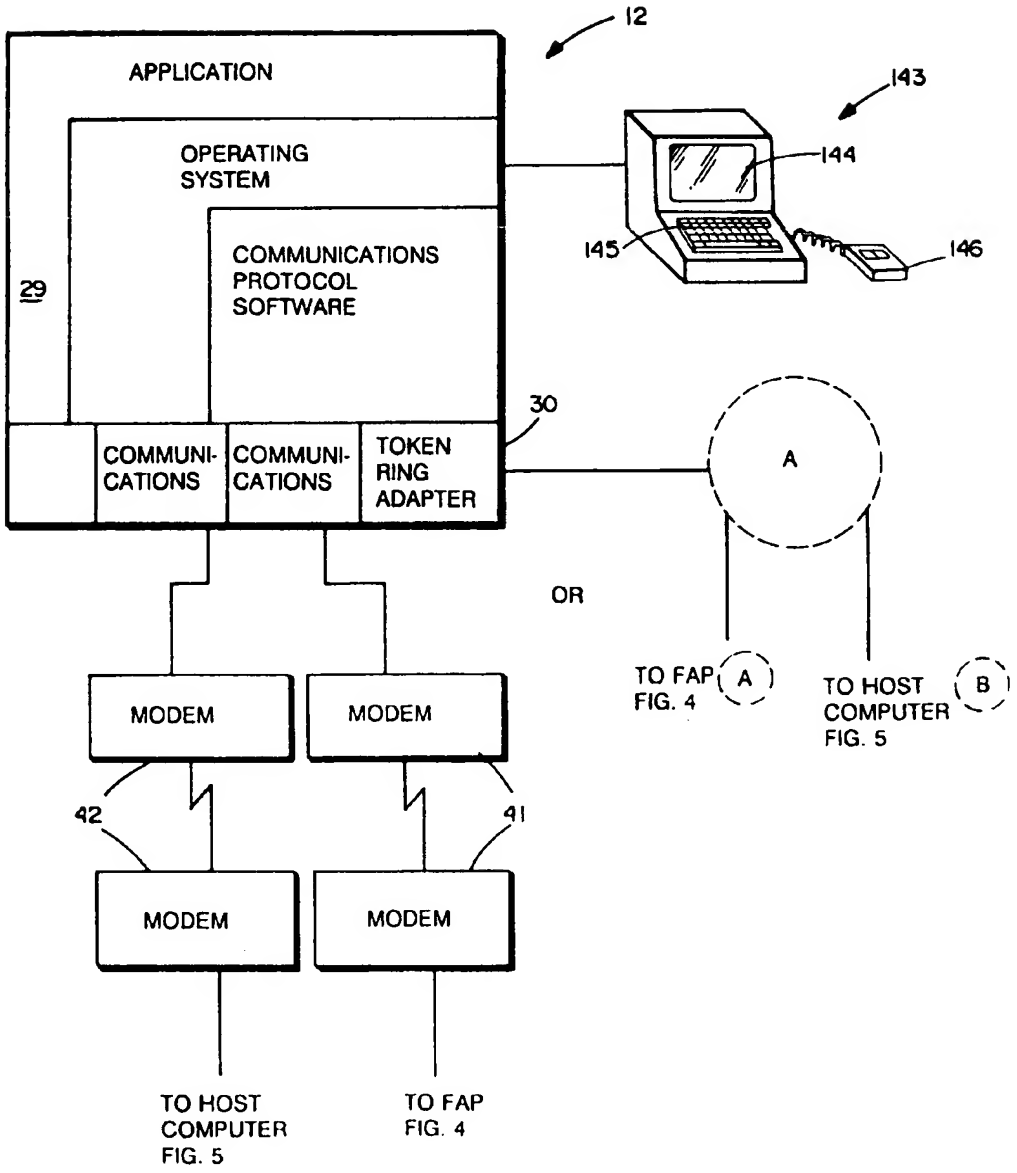

12
APPLICATION
OPERATING SYSTEM
COMMUNICATIONS PROTOCOL SOFTWARE
29
143
144
145
146
30
COMMUNI-CATIONS
COMMUNI-CATIONS
TOKEN RING ADAPTER
A
OR
MODEM
MODEM
42
41
MODEM
MODEM
TO FAP FIG. 4
A
TO HOST COMPUTER FIG. 5
B
TO HOST COMPUTER FIG. 5
TO FAP FIG. 4

Fig. 11

CENTRAL LIBRARY FACILITY DATA MODEL DIAGRAM

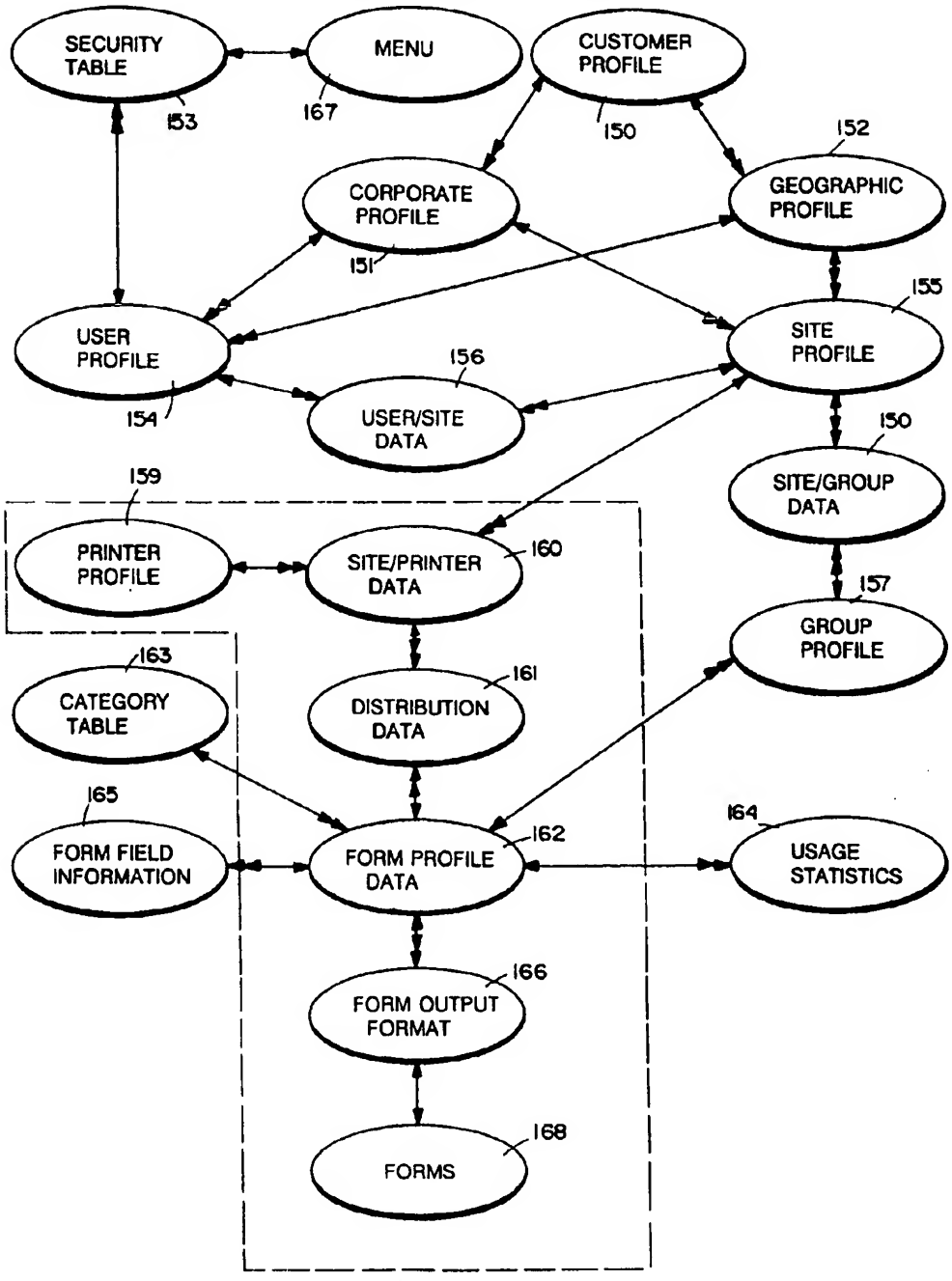


Fig. 12

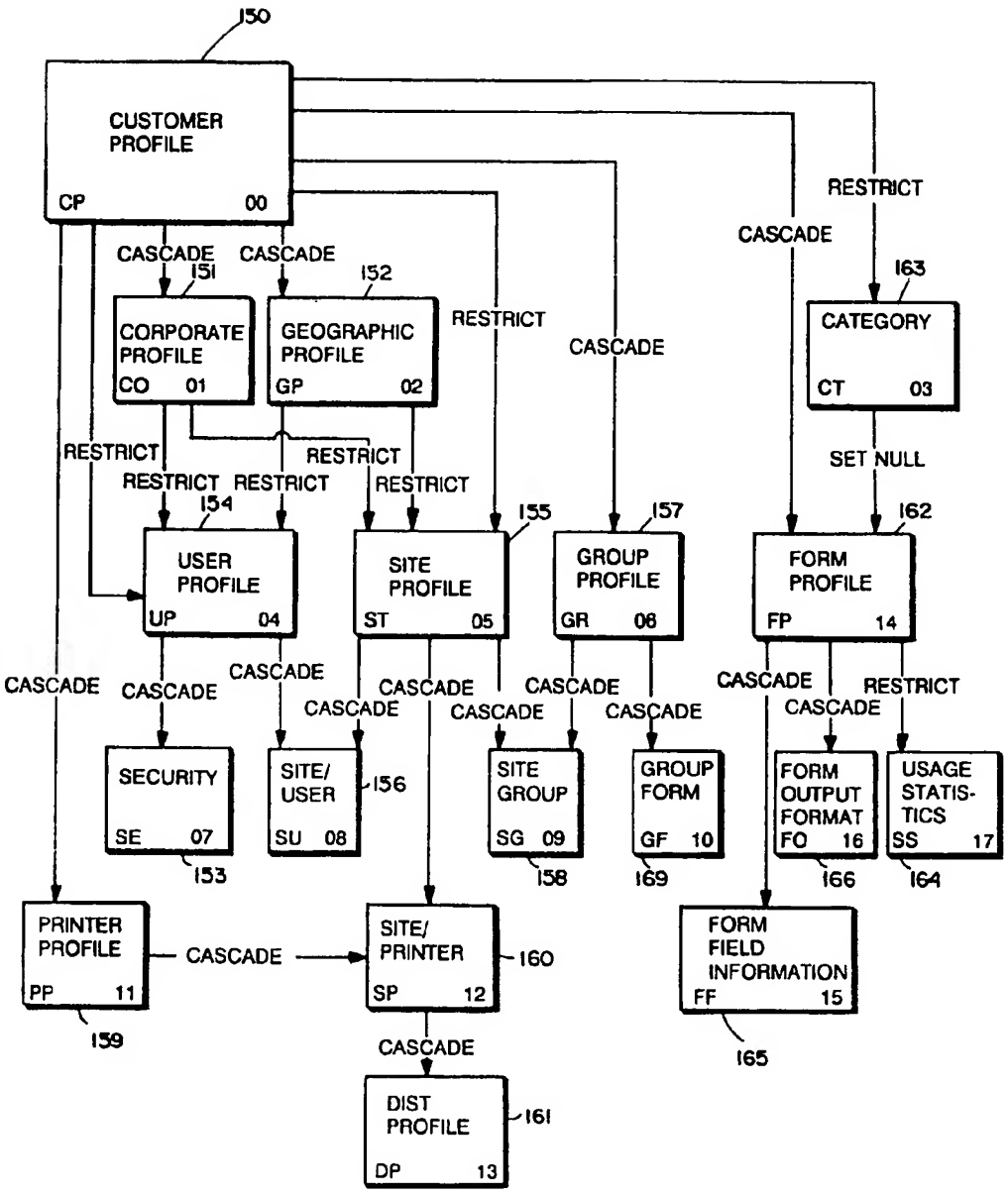

150
CUSTOMER PROFILE
CP 00
CASCADE
CASCADE
151
152
CORPORATE PROFILE
CO 01
GEOGRAPHIC PROFILE
GP 02
RESTRICT
CASCADE
RESTRICT
163
CATEGORY
CT 03
SET NULL
RESTRICT
RESTRICT
RESTRICT
RESTRICT
RESTRICT
154
155
157
162
USER PROFILE
UP 04
SITE PROFILE
ST 05
GROUP PROFILE
GR 06
FORM PROFILE
FP 14
CASCADE
CASCADE
CASCADE
CASCADE
CASCADE
CASCADE
CASCADE
CASCADE
CASCADE
RESTRICT
SECURITY
SE 07
SITE/ USER
SU 08
156
SITE GROUP
SG 09
GROUP FORM
GF 10
FORM OUTPUT FORMAT
FO 16
USAGE STATIS-TICS
SS 17
153
158
169
166
164
PRINTER PROFILE
PP 11
CASCADE
SITE/ PRINTER
SP 12
160
FORM FIELD INFORMATION
FF 15
159
165
CASCADE
DIST PROFILE
DP 13
161

Fig. 13a

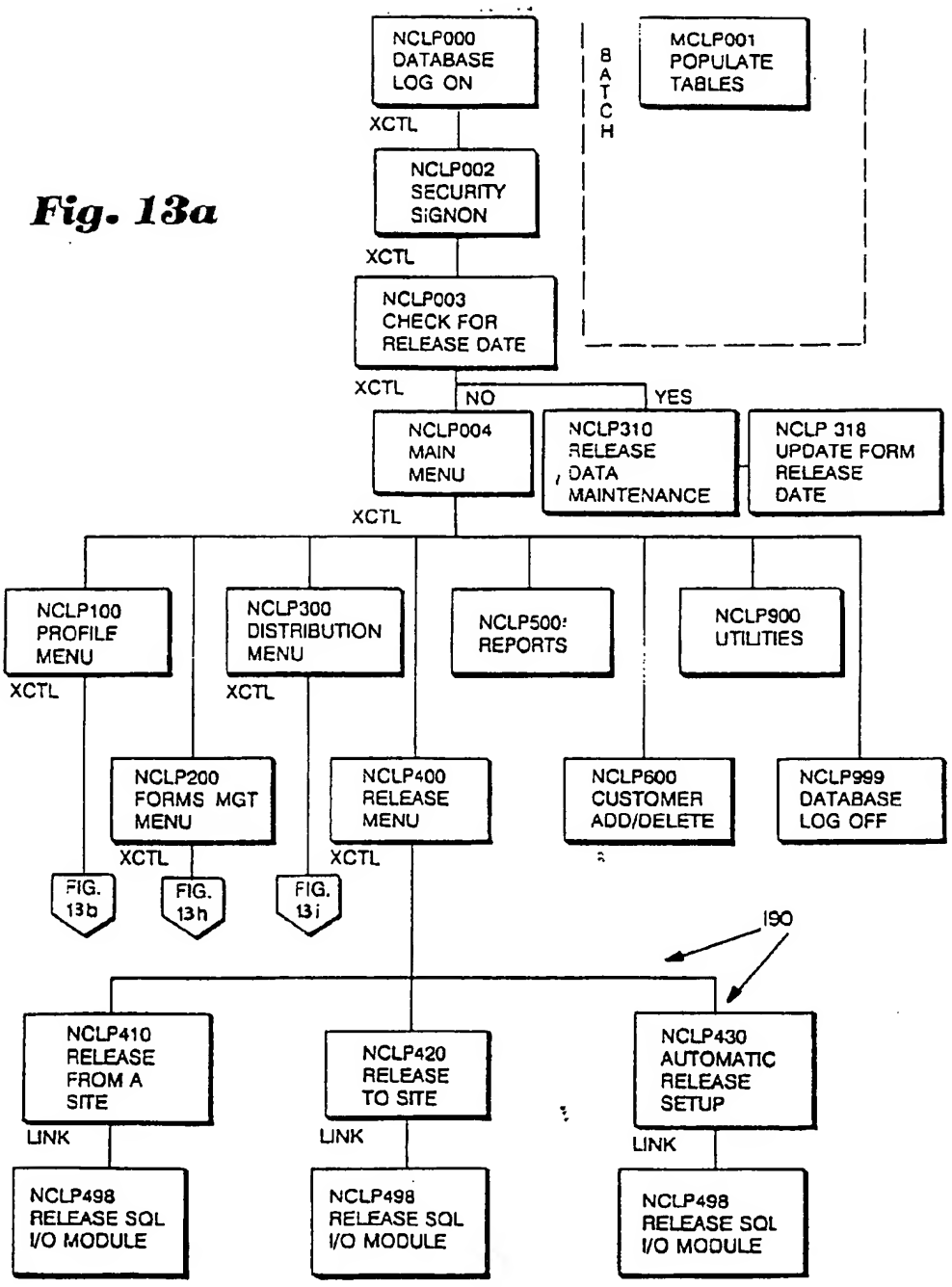

NCLP000
DATABASE
LOG ON
XCTL
NCLP002
SECURITY
SiGNON
XCTL
NCLP003
CHECK FOR
RELEASE DATE
XCTL
NO
YES
NCLP004
MAIN
MENU
XCTL
NCLP310
RELEASE
DATA
MAINTENANCE
NCLP 318
UPDATE FORM
RELEASE
DATE
BATCH
MCLP001
POPULATE
TABLES
NCLP100
PROFILE
MENU
XCTL
NCLP300
DISTRIBUTION
MENU
XCTL
NCLP500
REPORTS
NCLP900
UTILITIES
NCLP200
FORMS MGT
MENU
XCTL
NCLP400
RELEASE
MENU
XCTL
NCLP600
CUSTOMER
ADD/DELETE
NCLP999
DATABASE
LOG OFF
FIG.
13b
FIG.
13h
FIG.
13i
190
NCLP410
RELEASE
FROM A
SITE
LINK
NCLP420
RELEASE
TO SITE
LINK
NCLP430
AUTOMATIC
RELEASE
SETUP
LINK
NCLP498
RELEASE SQL
I/O MODULE
NCLP498
RELEASE SQL
I/O MODULE
NCLP498
RELEASE SQL
I/O MODULE

Fig. 13b

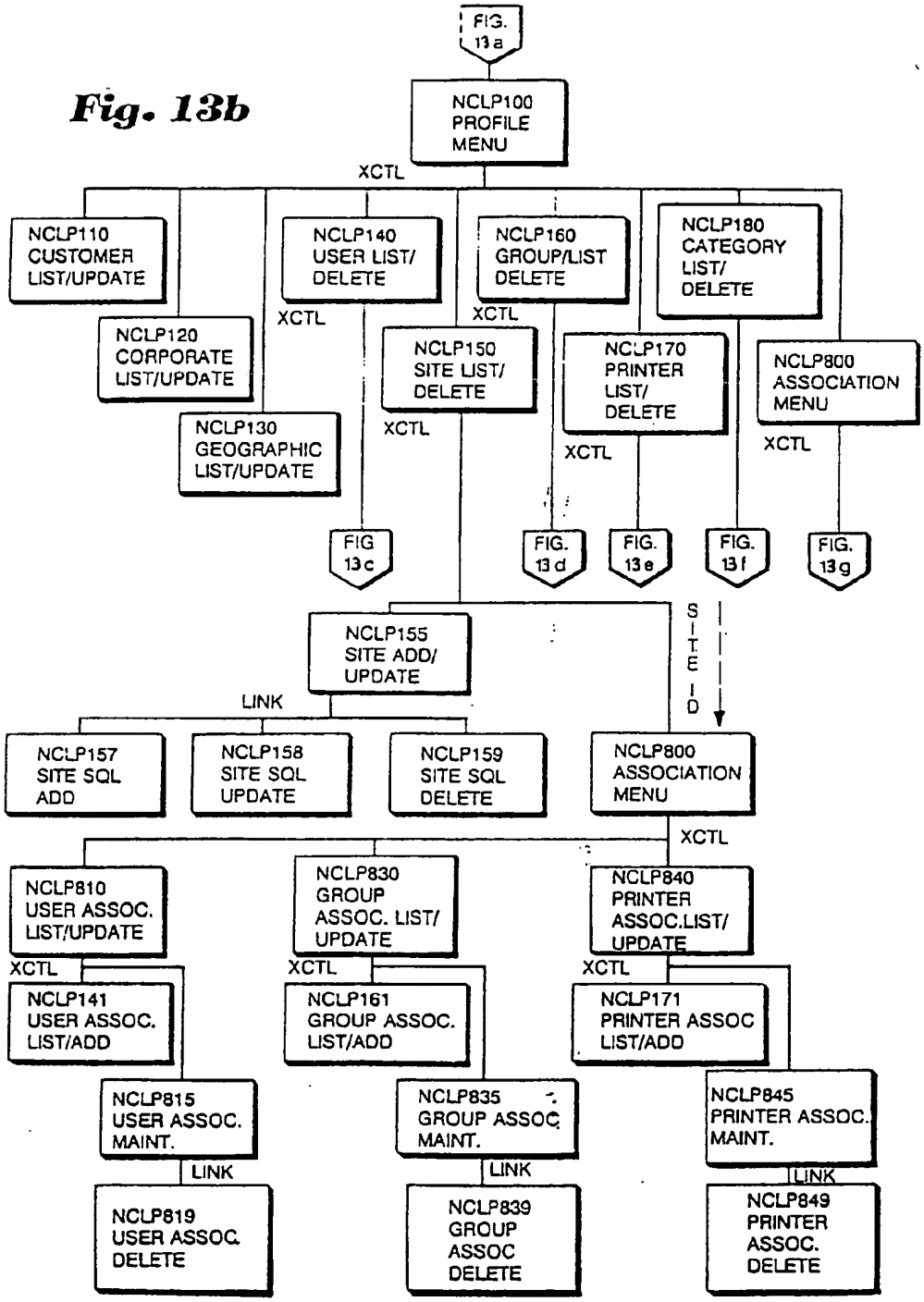


FIG. 13a
NCLP100 PROFILE MENU
XCTL
NCLP110 CUSTOMER LIST/UPDATE
NCLP120 CORPORATE LIST/UPDATE
NCLP130 GEOGRAPHIC LIST/UPDATE
NCLP140 USER LIST/ DELETE
XCTL
NCLP150 SITE LIST/ DELETE
XCTL
NCLP160 GROUP/LIST DELETE
XCTL
NCLP170 PRINTER LIST/ DELETE
XCTL
NCLP180 CATEGORY LIST/ DELETE
NCLP800 ASSOCIATION MENU
XCTL
FIG 13c
FIG. 13d
FIG. 13e
FIG. 13f
FIG. 13g
NCLP155 SITE ADD/ UPDATE
LINK
NCLP157 SITE SQL ADD
NCLP158 SITE SQL UPDATE
NCLP159 SITE SQL DELETE
SITE ID
NCLP800 ASSOCIATION MENU
XCTL
NCLP810 USER ASSOC. LIST/UPDATE
XCTL
NCLP141 USER ASSOC. LIST/ADD
NCLP815 USER ASSOC. MAINT.
LINK
NCLP819 USER ASSOC. DELETE
NCLP830 GROUP ASSOC. LIST/ UPDATE
XCTL
NCLP161 GROUP ASSOC. LIST/ADD
NCLP835 GROUP ASSOC MAINT.
LINK
NCLP839 GROUP ASSOC DELETE
NCLP840 PRINTER ASSOC.LIST/ UPDATE
XCTL
NCLP171 PRINTER ASSOC LIST/ADD
NCLP845 PRINTER ASSOC. MAINT.
LINK
NCLP849 PRINTER ASSOC. DELETE

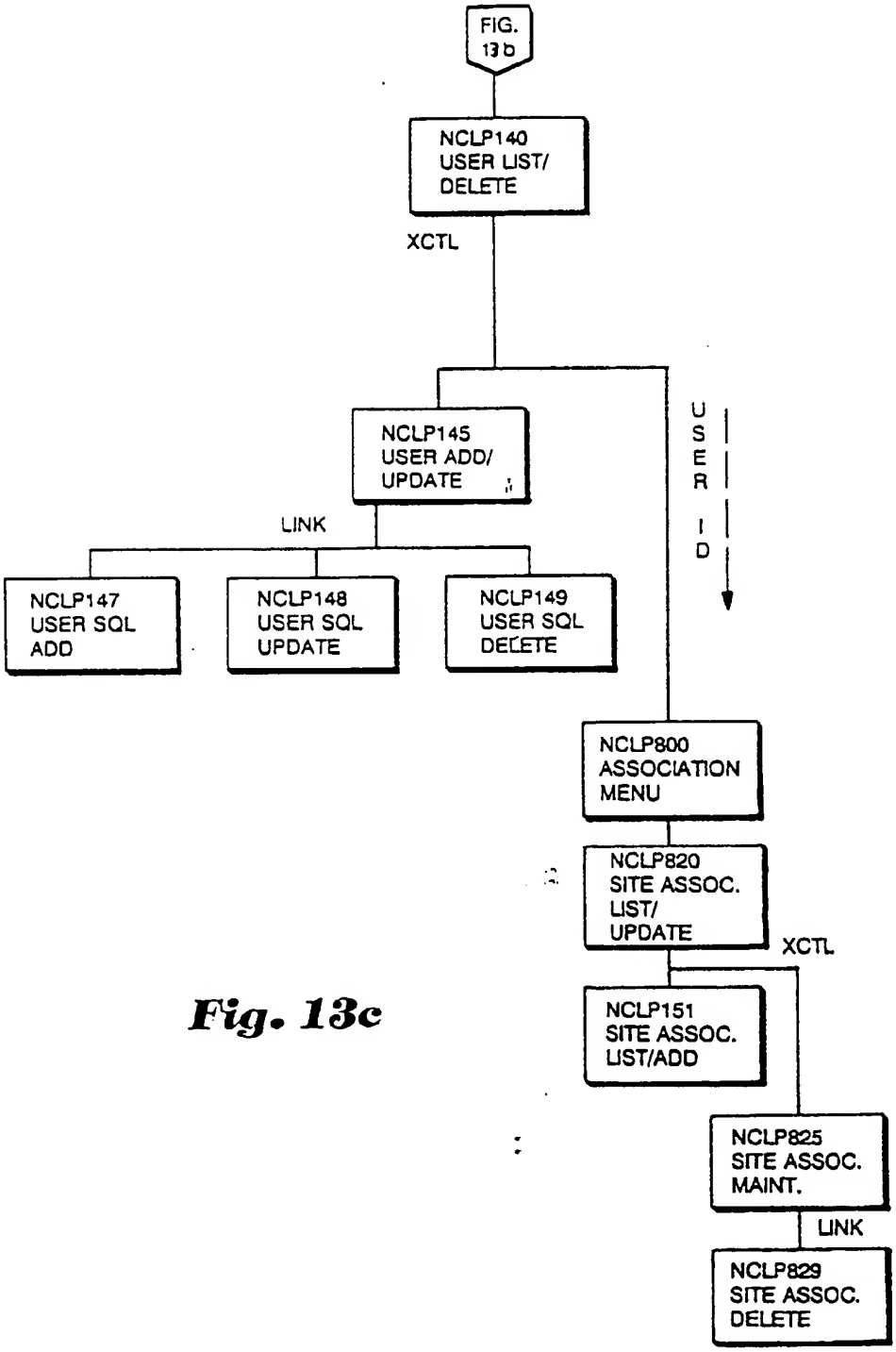


FIG. 13b
NCLP140 USER LIST/ DELETE
XCTL
NCLP145 USER ADD/ UPDATE
LINK
NCLP147 USER SQL ADD
NCLP148 USER SQL UPDATE
NCLP149 USER SQL DELETE
USER ID
NCLP800 ASSOCIATION MENU
NCLP820 SITE ASSOC. LIST/ UPDATE
XCTL
NCLP151 SITE ASSOC. LIST/ADD
NCLP825 SITE ASSOC. MAINT.
LINK
NCLP829 SITE ASSOC. DELETE

Fig. 13c

Fig. 13d

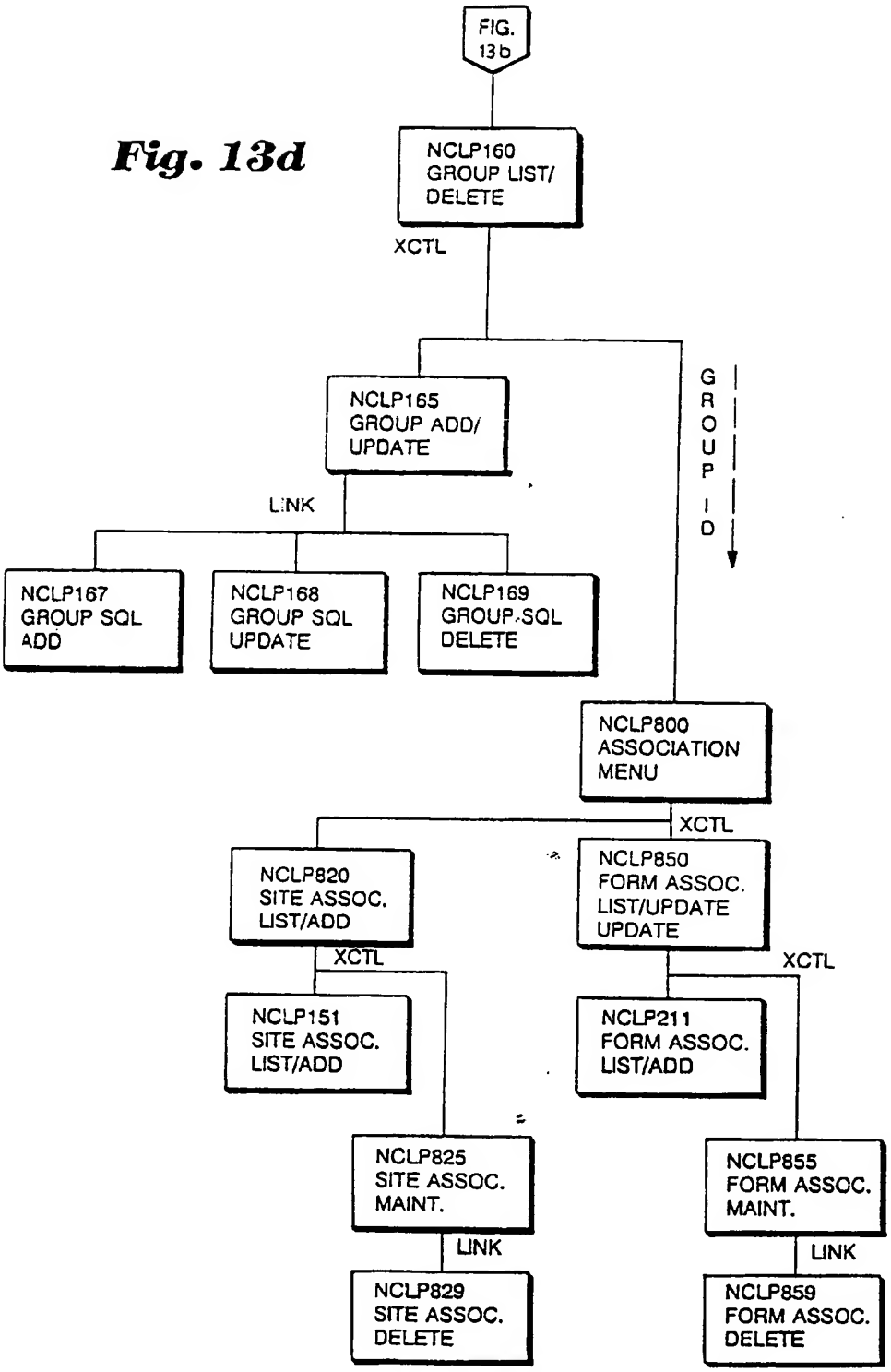


FIG. 13b
NCLP160 GROUP LIST/ DELETE
XCTL
NCLP165 GROUP ADD/ UPDATE
LINK
NCLP167 GROUP SQL ADD
NCLP168 GROUP SQL UPDATE
NCLP169 GROUP SQL DELETE
GROUP ID
NCLP800 ASSOCIATION MENU
XCTL
NCLP820 SITE ASSOC. LIST/ADD
XCTL
NCLP151 SITE ASSOC. LIST/ADD
NCLP825 SITE ASSOC. MAINT.
LINK
NCLP829 SITE ASSOC. DELETE
NCLP850 FORM ASSOC. LIST/UPDATE UPDATE
XCTL
NCLP211 FORM ASSOC. LIST/ADD
NCLP855 FORM ASSOC. MAINT.
LINK
NCLP859 FORM ASSOC. DELETE

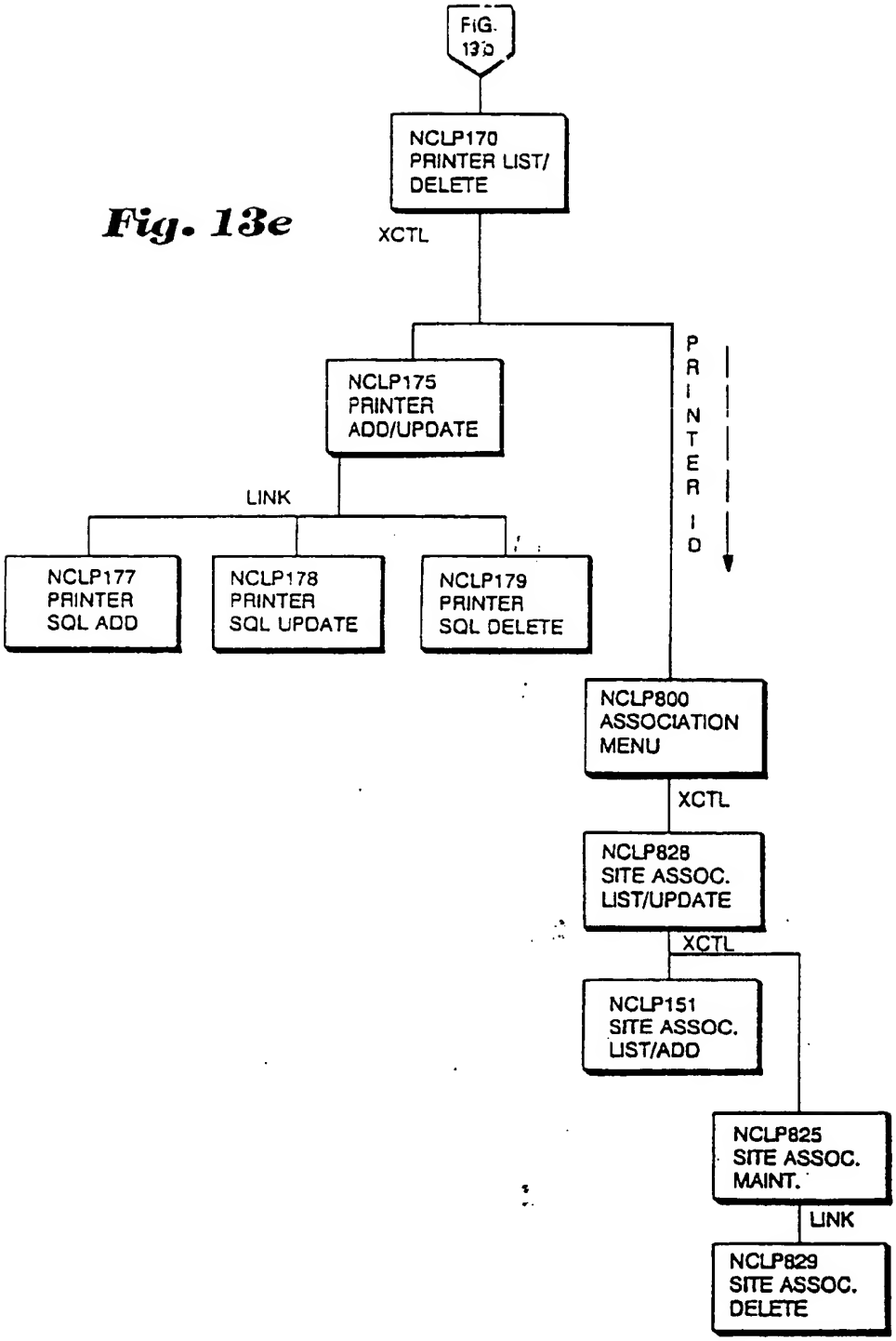


FIG. 13D
NCLP170
PRINTER LIST/
DELETE
XCTL
NCLP175
PRINTER
ADD/UPDATE
LINK
NCLP177
PRINTER
SQL ADD
NCLP178
PRINTER
SQL UPDATE
NCLP179
PRINTER
SQL DELETE
PRINTER ID
NCLP800
ASSOCIATION
MENU
XCTL
NCLP828
SITE ASSOC.
LIST/UPDATE
XCTL
NCLP151
SITE ASSOC.
LIST/ADD
NCLP825
SITE ASSOC.
MAINT.
LINK
NCLP829
SITE ASSOC.
DELETE

Fig. 13e

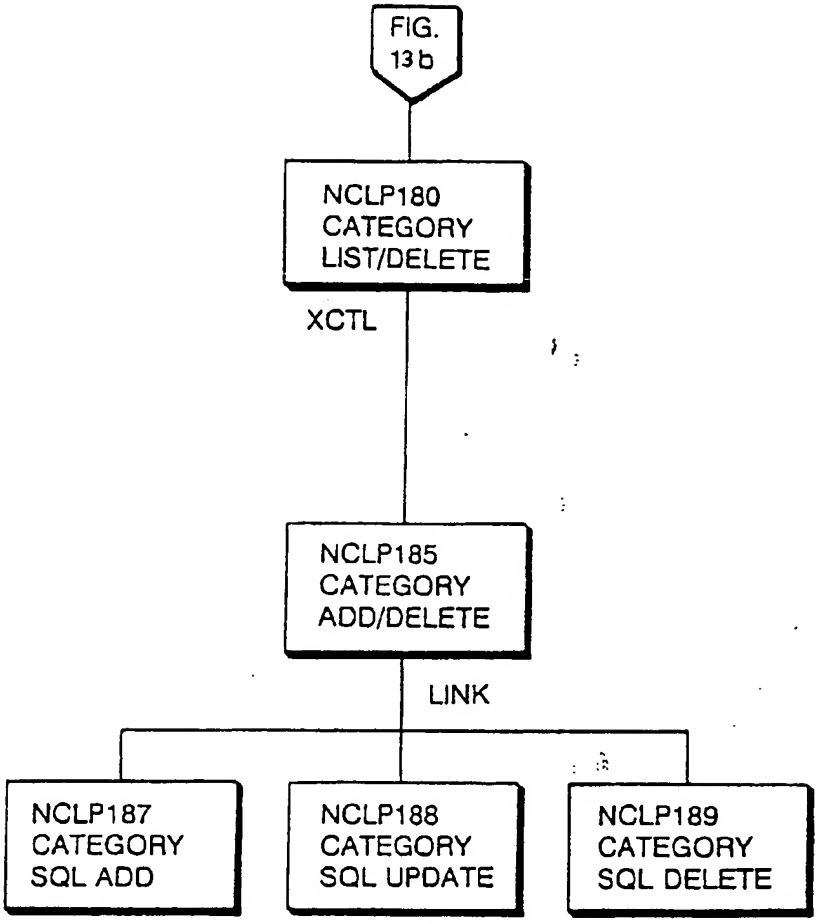


FIG. 13b
NCLP180 CATEGORY LIST/DELETE
XCTL
NCLP185 CATEGORY ADD/DELETE
LINK
NCLP187 CATEGORY SQL ADD
NCLP188 CATEGORY SQL UPDATE
NCLP189 CATEGORY SQL DELETE

Fig. 13f

Fig. 13g

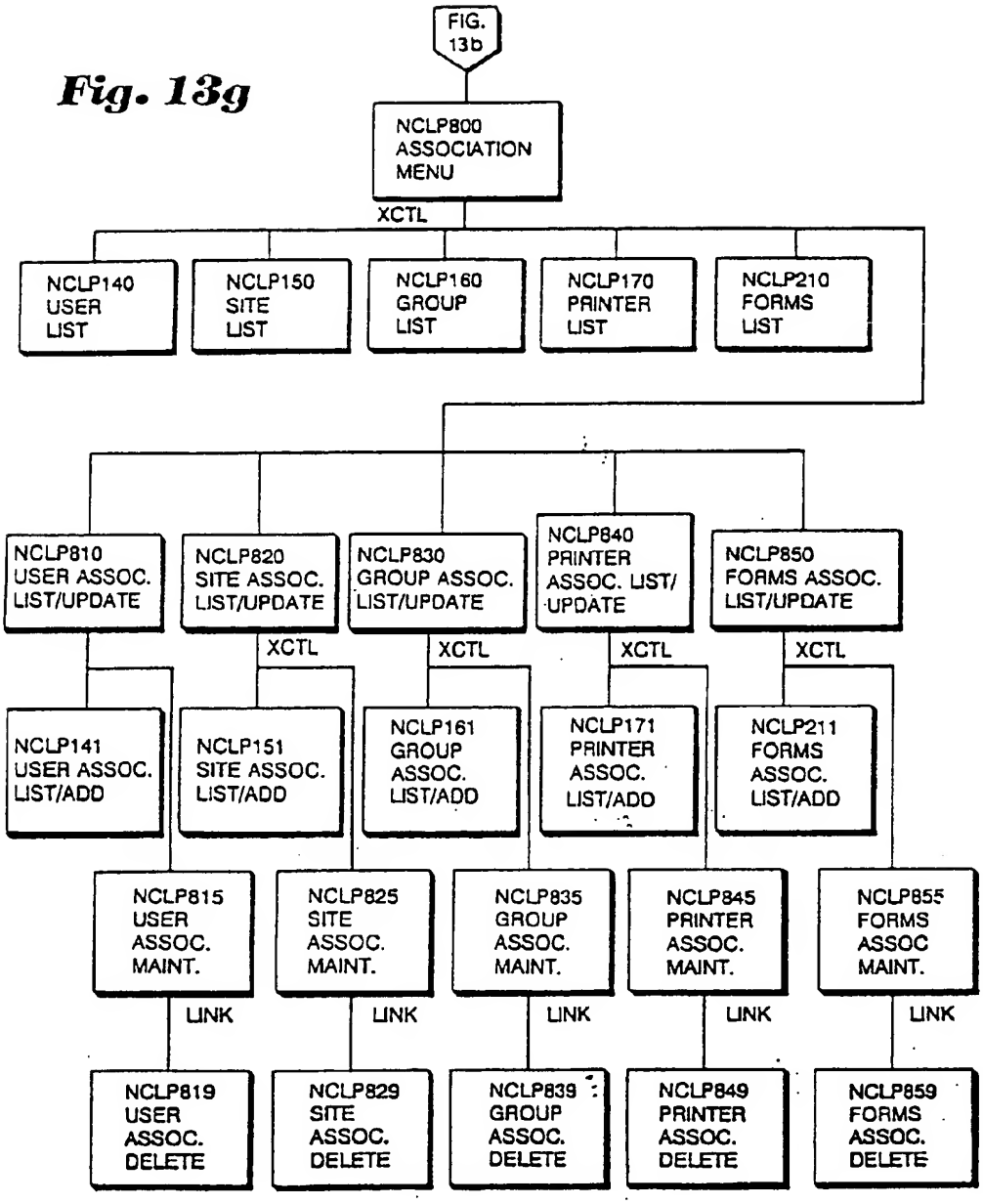


FIG. 13b
NCLP800 ASSOCIATION MENU
XCTL
NCLP140 USER LIST
NCLP150 SITE LIST
NCLP160 GROUP LIST
NCLP170 PRINTER LIST
NCLP210 FORMS LIST
NCLP810 USER ASSOC. LIST/UPDATE
NCLP820 SITE ASSOC. LIST/UPDATE
NCLP830 GROUP ASSOC. LIST/UPDATE
NCLP840 PRINTER ASSOC. LIST/ UPDATE
NCLP850 FORMS ASSOC. LIST/UPDATE
XCTL
XCTL
XCTL
XCTL
NCLP141 USER ASSOC. LIST/ADD
NCLP151 SITE ASSOC. LIST/ADD
NCLP161 GROUP ASSOC. LIST/ADD
NCLP171 PRINTER ASSOC. LIST/ADD
NCLP211 FORMS ASSOC. LIST/ADD
NCLP815 USER ASSOC. MAINT.
NCLP825 SITE ASSOC. MAINT.
NCLP835 GROUP ASSOC. MAINT.
NCLP845 PRINTER ASSOC. MAINT.
NCLP855 FORMS ASSOC MAINT.
LINK
LINK
LINK
LINK
LINK
NCLP819 USER ASSOC. DELETE
NCLP829 SITE ASSOC. DELETE
NCLP839 GROUP ASSOC. DELETE
NCLP849 PRINTER ASSOC. DELETE
NCLP859 FORMS ASSOC. DELETE

Fig. 13h

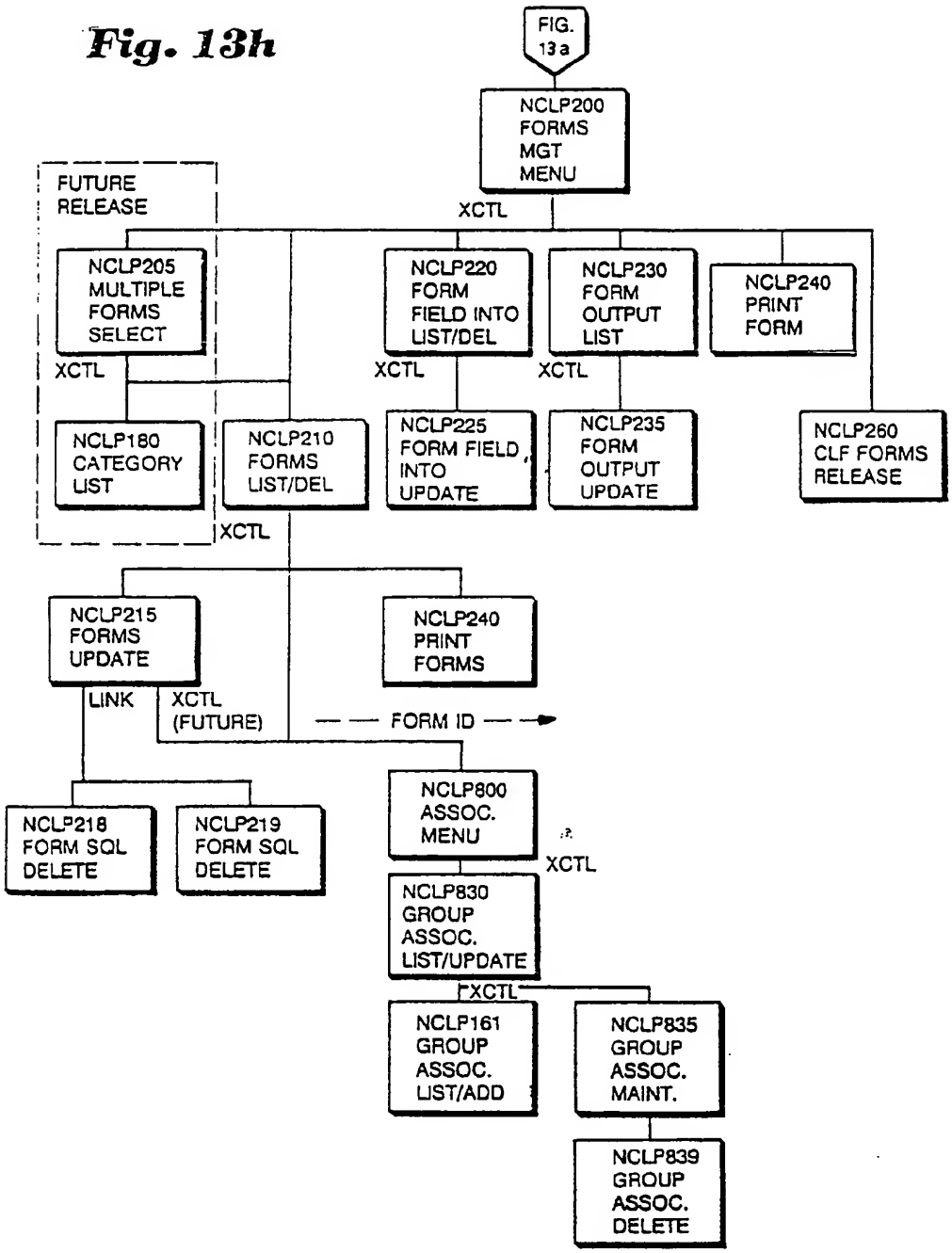


FIG. 13a
NCLP200 FORMS MGT MENU
XCTL
FUTURE RELEASE
NCLP205 MULTIPLE FORMS SELECT
NCLP220 FORM FIELD INTO LIST/DEL
NCLP230 FORM OUTPUT LIST
NCLP240 PRINT FORM
XCTL
XCTL
XCTL
NCLP180 CATEGORY LIST
NCLP210 FORMS LIST/DEL
NCLP225 FORM FIELD INTO UPDATE
NCLP235 FORM OUTPUT UPDATE
NCLP260 CLF FORMS RELEASE
XCTL
NCLP215 FORMS UPDATE
NCLP240 PRINT FORMS
LINK
XCTL (FUTURE)
FORM ID
NCLP218 FORM SQL DELETE
NCLP219 FORM SQL DELETE
NCLP800 ASSOC. MENU
XCTL
NCLP830 GROUP ASSOC. LIST/UPDATE
XCTL
NCLP161 GROUP ASSOC. LIST/ADD
NCLP835 GROUP ASSOC. MAINT.
NCLP839 GROUP ASSOC. DELETE

Fig. 13i

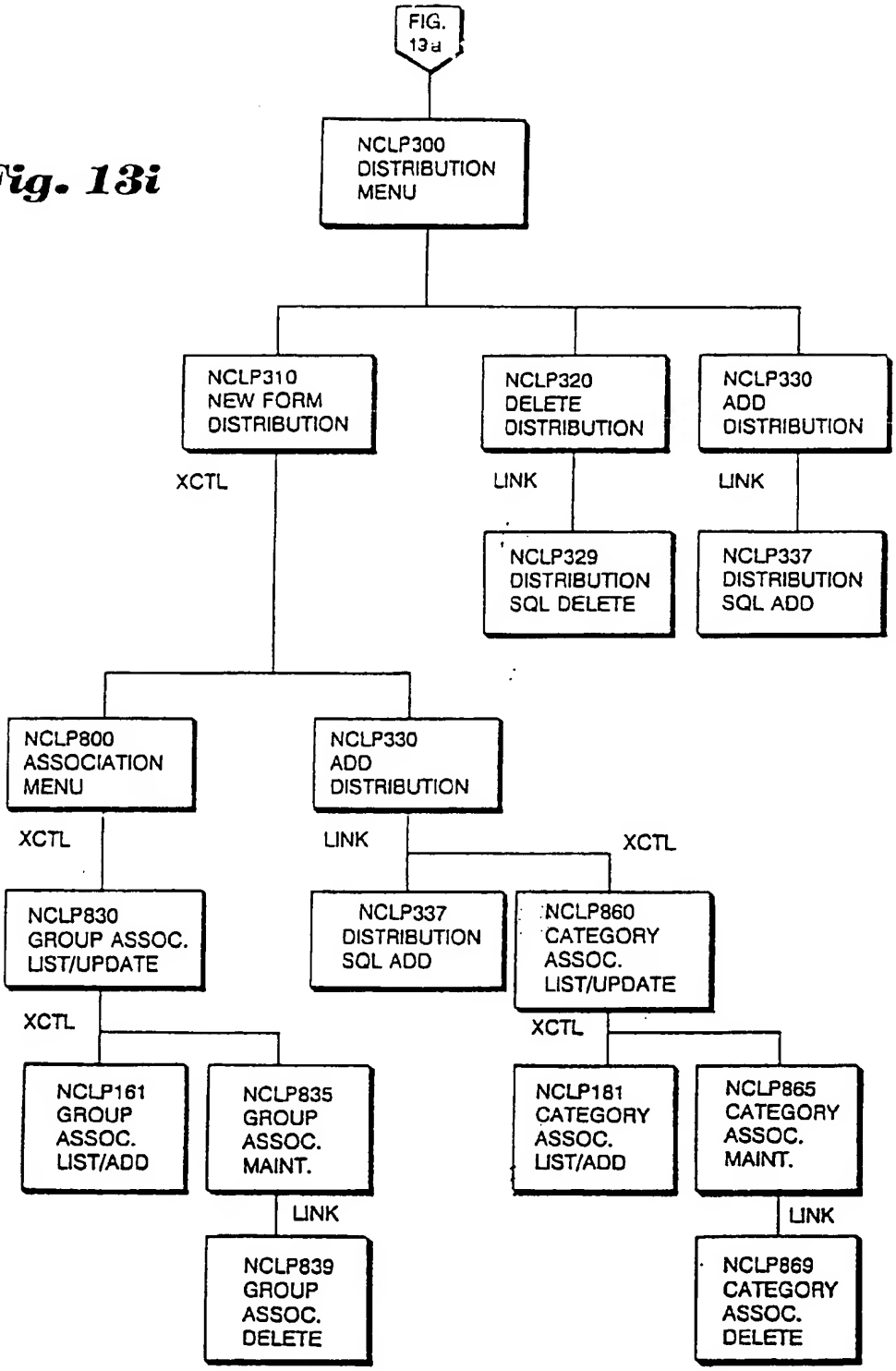


FIG. 13a
NCLP300 DISTRIBUTION MENU
NCLP310 NEW FORM DISTRIBUTION
NCLP320 DELETE DISTRIBUTION
NCLP330 ADD DISTRIBUTION
XCTL
LINK
LINK
NCLP329 DISTRIBUTION SQL DELETE
NCLP337 DISTRIBUTION SQL ADD
NCLP800 ASSOCIATION MENU
NCLP330 ADD DISTRIBUTION
XCTL
LINK
XCTL
NCLP830 GROUP ASSOC. LIST/UPDATE
NCLP337 DISTRIBUTION SQL ADD
NCLP860 CATEGORY ASSOC. LIST/UPDATE
XCTL
XCTL
NCLP161 GROUP ASSOC. LIST/ADD
NCLP835 GROUP ASSOC. MAINT.
NCLP181 CATEGORY ASSOC. LIST/ADD
NCLP865 CATEGORY ASSOC. MAINT.
LINK
LINK
NCLP839 GROUP ASSOC. DELETE
NCLP869 CATEGORY ASSOC. DELETE

Fig. 14

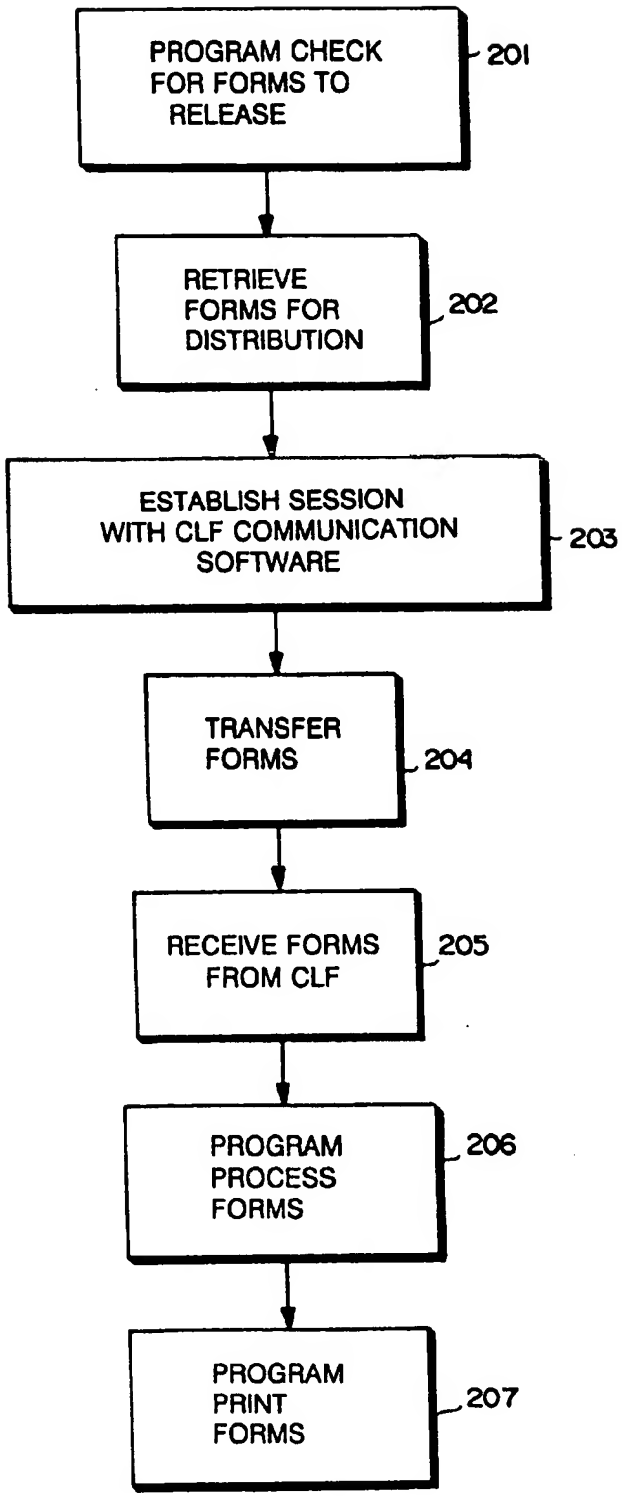

PROGRAM CHECK FOR FORMS TO RELEASE
201
RETRIEVE FORMS FOR DISTRIBUTION
202
ESTABLISH SESSION WITH CLF COMMUNICATION SOFTWARE
203
TRANSFER FORMS
204
RECEIVE FORMS FROM CLF
205
PROGRAM PROCESS FORMS
206
PROGRAM PRINT FORMS
207

Fig. 15

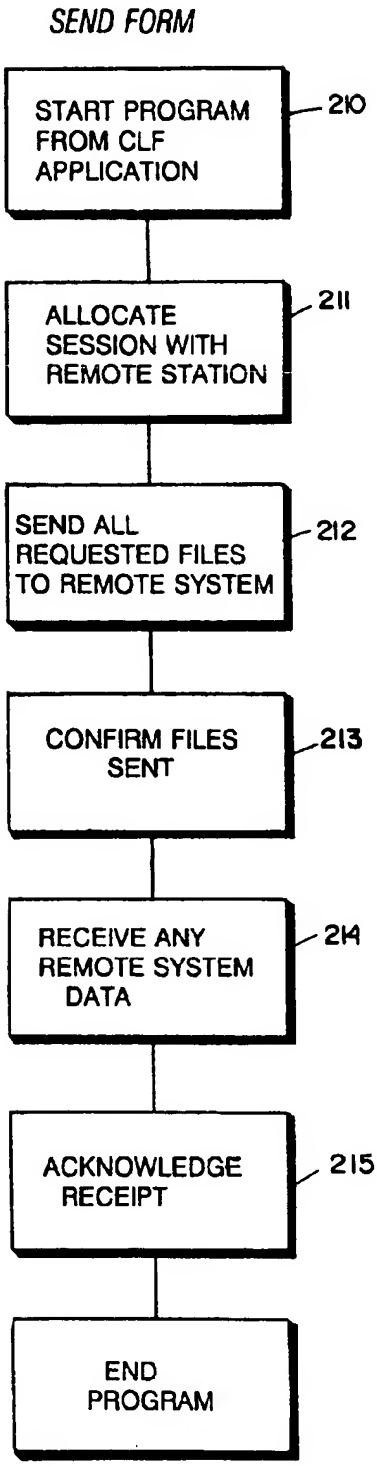
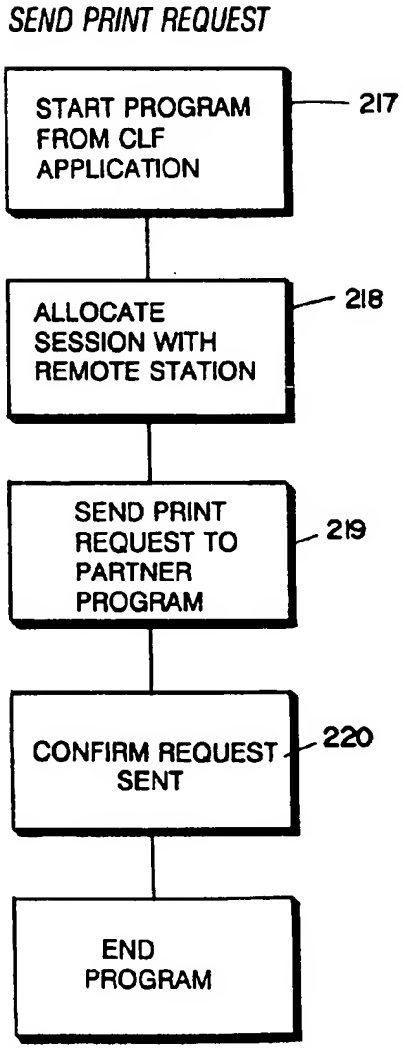

SEND FORM
START PROGRAM FROM CLF APPLICATION
210
ALLOCATE SESSION WITH REMOTE STATION
211
SEND ALL REQUESTED FILES TO REMOTE SYSTEM
212
CONFIRM FILES SENT
213
RECEIVE ANY REMOTE SYSTEM DATA
214
ACKNOWLEDGE RECEIPT
215
END PROGRAM

Fig. 16


SEND PRINT REQUEST
START PROGRAM FROM CLF APPLICATION
217
ALLOCATE SESSION WITH REMOTE STATION
218
SEND PRINT REQUEST TO PARTNER PROGRAM
219
CONFIRM REQUEST SENT
220
END PROGRAM